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# INTERNATIONAL ABSTRACT OF SURGERY

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## COLLECTIVE REVIEW

### RECENT PROGRESS IN PEDIATRIC SURGERY

By COLEMAN G. BUFORD, M.D., F.A.C.S., CHICAGO

JUST as pediatric surgery had begun to receive some impetus and recognition as a highly specialized branch of surgery, interest in it was interrupted by the world war which took so many high grade workers to the front; and the attention of surgeons in general became centered upon war surgery. The contributions to the literature naturally began to diminish. Aside from hospitals for children, there have been relatively few hospitals which have set aside a separate department for the surgery of children so that a volume of this work would fall into the hands of a few, who, with their attention so engaged, would develop it and bring forward new questions and interesting points for the betterment of surgery among children.

Few busy general surgeons ever have many infants and small children in their services in any one year. The scarcity of this work and the occupation of surgeons in a much larger sphere has caused the majority of them to fail in grasping much that is valuable and really necessary for the best surgical work among young children. One cannot find the most valuable points ready for him in books; nor if an experienced pediatric surgeon were asked, "What is the difference between your field of work and general surgery, and what are the points the pediatric surgeon has at his command that the general surgeon has not in handling the same class of patients?" he could no more answer than could the artist tell how he mixed his paints to secure that splendid color effect in his sky.

One may develop himself so as to possess all that is implied by living among surgical children

and pediatricians. The longer he does so, the more novel will be his experiences and the more multiple and far-reaching will be his observations. The very high fatality which prevails following surgical operations on infants and young children is the strongest evidence that one has something more to think of than to anesthetize a baby and skilfully perform an operation. The author learned better that to prepare these patients with depleting cathartics or to leave a baby too long without food either before or after operation; this is the frequent starting point of nutritional difficulties which may not be checked. One must never hurry into operations of convenience without being sure that the child's digestion and present state of nourishment is as good as it can be made. In all cases the period of anesthesia and the amount of anesthetic should be reduced to a minimum. Preparation of the field before the anesthetic is begun diminishes considerably the duration of anesthesia. It is certain that alcoholic vapors suspended in the blood of young animals cause protoplasmal damage often resulting fatally. This is especially true of chloform, the commonly chosen anesthetic for babies, and a serious error.

The matter of allowing the oozing of blood to continue during operations on babies is a serious thing. Every drop of blood lost counts far more against an infant's prospects for recovery than it does in later life. About eight per cent of the adult body weight is blood, while in the newborn it is about five per cent. In adults, when five of this eight per cent is lost, the patient is pretty certain to die. Should a baby lose the same percentage it is totally exsanguinated. The amount



of blood of babies lost at operation is usually underestimated. The author has previously written (10) that they go to their beds and may deceive one by the quietness of their slumber and their rosy appearance. Continued watching will often show good color of the skin which frequently alternates with extreme pallor about the lips and nose and is evidence of grave danger. When such is seen, the surgeon must give serious consideration to the immediate need of blood and do direct or indirect transfusion. Hypodermoclysis and transfusion with normal salt solution do not often satisfy the demand in young children, and are usually given in excessive amounts causing hydræmia and greatly diminished coagulability.

In the last three years much progress has been made with transfusion by both the direct and indirect methods to resupply the loss of blood through accident, operation, or disease. The greatest drawback to its common acceptance and use as a therapeutic measure is the lack of technical skill, fear of air embolism, and the introduction of clots. The citrate method of indirect transfusion as perfected by Lewisohn (50) and others is so simple that it may safely be used by any one having average surgical skill. Lewisohn states that two-tenths per cent of sodium citrate in blood prevents coagulation outside the body for two or three days. Five grams of sodium citrate can be safely introduced into the adult; more produces toxic symptoms. He rarely transfuses more than 1,000 ccm. of blood, which represents two grams of sodium citrate.

There is no doubt but that transfusion of blood is in its infancy and is going to prove of great value in the treatment of surgical infections, infectious diseases, and as an aid to convalescence in greatly depleted children. The Percy tubes for the transfusion of whole blood are usually too large at their point to introduce into the veins of young children unless the jugular, axillary or femoral be used. They may be blown with especially small points so as to be usable in superficial veins. Bernheim (4) has devised a syringe which, if it has borne out his early expectations, certainly simplifies transfusion. With it the blood is aspirated from the donor into the syringe barrel and with pressure on the piston is immediately injected into the recipient.

Helmholz (36) and others have shown the ease with which indirect transfusions of citrated blood may be made through the longitudinal sinus when the anterior fontanelle is open. This is one of the most inviting routes and because of the ease with which it may be performed should make blood

transfusion in babies much more popular, but one must be aware of the danger of passing the needle through the sinus into the brain, thus tearing it; and one must avoid injecting blood into the brain tissue itself.

Woltmann (88) has injected citrated human blood in cases of melæna of the newborn with benefit where injections of horse serum failed. Pool (66) transfused blood into a child of eight months suffering from von Jaksch anæmia, using the Lindemann method. This was followed by splenectomy. There was temporary improvement. In making osteoplastic flaps of the skull when the fontanelles are open, much time may be saved by incision of the fontanelle, passing a director beneath the skull and continuing the osseous incision with heavy scissors instead of ronguers.

Attention has been called (10) to the uselessness of attempting to treat internal hydrocephalus by any one operative procedure on account of the different causes and pathologic states. On the whole there is little new and encouraging concerning the treatment of hydrocephalus. Haynes in 1910 introduced a new method of sinoventricular drainage in a case operated upon for hydrocephalus. He recently reviewed this case (35) and reports the fontanelle tension diminished with general improvement. Peskind (61) reports a similar ventricular drainage with good results.

Intracranial hæmorrhage of the newborn is being diagnosed with increased frequency and has become distinctly a surgical affection. The very mild primary mental, motor, and sensory disturbances may be subjected to temporizing treatment but even these may result in certain brain damage resulting in epilepsy or spastic contractions of muscle groups. If there be doubt as to the diagnosis, a lumbar or subdural puncture may be made. In the milder cases one may consider slight incision of one of the fontanelles or cranial sutures to relieve tension and await developments. In the more severe types an osteoplastic flap should be turned down after proper localization, the clot removed, and the bleeding vessels ligated. It is certainly true that some of the hæmorrhages come from vessel injuries at the base of the skull and cannot be reached for ligation. The operation at least accomplishes relief from pressure and increases the child's prospects of recovery.

In a certain number of patients having either surface, subcortical or basilar hæmorrhages the operation should end with decompression because of the likelihood of failing to find the bleeding points. Useless searching causes increased trau-



ma and loss of blood and increases the risk. There is no doubt of the wisdom of immediate operation in the large majority of cases when the condition of the child permits it. If pressure is not relieved, the surface hæmorrhages permanently damage the cortical cells through pressure and irritation by resulting clots; while in subcortical hæmorrhages, infiltration with blood progresses with resultant damage to the brain cells and breaks up the fibrillary intercommunications.

Sharp and Farrell (75) report sixty-five cases of cerebral spastic paralysis due to hæmorrhage caused by lesions during delivery on whom cranial decompressions were made. There were nine deaths following operation and eight more within two years. Twenty-five of the patients showed a more or less marked improvement and in nineteen there was no improvement. The authors point out the advantages of early operation in selected cases, as the earlier the operations are done, the better are the results.

John Graham has called attention in an unpublished paper to the frequency of fractured skulls in early life coming into the service of the Children's Memorial Hospital showing few or no focal symptoms, which have been favorably dealt with by temporizing treatment. He emphasizes that when dealing with the elastic skulls of young children and their concussions and fractures a different problem is presented than when dealing with the skulls of adults. Maidagan (53) lately reported on two trepanations for crushing cranial injuries in children of eleven months and nine years respectively. Good results were obtained in both cases.

Surgeons always approach protrusions of the cranial contents in infants with some trepidation. There is always uncertainty as to what will be encountered within and what will be the end-result. Peskind (62) removed an encephalocele from behind the posterior fontanelle in an infant twenty-four days old. It weighed 3 grams. The child recovered. Fracassi (25) did a posterior craniotomy in a boy of thirteen years for a cerebellar tumor. The patient died forty-eight hours later. The tumor was found to be a fibrosarcoma of the pontocerebellar angle. Garzon (28) removed a tumor 47 by 27 cm. from the occipital region in a newly born infant. The child lived, but hydrocephalus developed a few days later.

Kalb (43) operated for epilepsy on a boy of fourteen years. He uncovered the left cranial zone and opened the dura. The cerebral cortex was found altered in spots. He dissected small islets out of the diseased areas, leaving the normal cortex. After a week the paralysis had diminished

and the patient could walk. After a year and half the physical and psychical improvement still continued.

Maranon and Pintos (54) in a recent case in which they operated upon a boy for a bullet wound of the head found the hypophyseal stalk severed. There was a syndrome of diabetes insipidus and abdominal adiposity. The case they consider establishes that proper kidney action depends upon the secretions of the hypophysis.

Sharpe (76) recommends operation in children even one month old for the treatment of paralyses of the brachial plexus. The earlier the anastomosis of the nerve roots is made, the better are the results and the less formation of fibrous tissue occurs. He gives particulars of such cases operated upon up to the fourteenth year.

In view of the increase in popular recognition of different types of acute bone lesions, there is evidently more need than ever of making roentgen plates of bones of children. Scurvy and bone syphilis are bone lesions which are often revealed where they were not suspected. Osteomyelitis in children is usually demonstrable by X-ray plates, but it frequently occurs that the lesions do not show upon the plates in the first few days. In all cases of osteomyelitis there is an increased tendency among surgeons to search for and remove the primary focus of infection, which is more often found in the teeth and tonsils than is commonly supposed. By removing such foci there may prove to be great diminution in the number of patients showing multiple osteomyelitic foci. Where there has been destruction or surgical removal in the shafts of long bones and failure to regenerate, free inserts of bone are now possible. Such a case was reported by Henders (37) in a patient with osteomyelitis of the left tibia in which he did a subperiosteal resection of the whole shaft. There was incomplete regeneration. A graft taken from the opposite tibia was inserted and later on a second graft was made. The results have been quite satisfactory.

There is great need of surgeons giving more personal care to position and to appliances used in the treatment of fractures of the extremities in young children. It must be borne in mind that many of these cases showing great deformity upon the X-ray plates do not show very bad external deformities which would interfere greatly with future function. Many angulations where union is still imperfect may be forcibly corrected over a wooden wedge or sand bag, while in many where angulation is great and union perfect, correction may be best made by subcutaneous osteotomy rather than by the more dangerous open opera-



tions. It must not be forgotten also that many deformities resulting from angulation will undergo spontaneous correction, part of which is accomplished through the elongation of bones in their growth.

Pediatric surgeons quite generally discourage the excessive amount of open bone work for recent fractures which has been going on during the past few years, but frankly admit the wisdom of open work being done for bad irreducible fractures. Most of these will require no plating, bone inserts, or suturing by wire or other means to retain them in position, but of course should be carefully supported by splints which should go very much further beyond the point of fracture than in more fully developed patients.

Among the more interesting reports of bone work in children are the following: De Pena (19) reported three cases of vertebral osteomyelitis in children of nine, ten and fourteen years respectively. The operations ranged from incision of the periosteum to partial resection of the vertebrae. Rosati (73) removed a pedunculated congenital teratoma from the fourth lumbar vertebra with excellent recovery. Cates (13) reported operated cases of spina bifida. He has operated upon sixteen patients. Ten of these survived more than three months, but two of them died within six months; seven are alive at twenty months to eight years after operation. Petit de la Villeon (64) reports a case of a girl ten months of age operated upon for a lumbosacral tumor weighing 1,650 grams, who made an excellent recovery. Puech (67) made a subtotal resection of the scapula in a little girl eleven years of age for chronic osteoperiosteitis with recovery.

There has been no more novel and creditable work in any branch of surgery in recent years than in that of orthopedic surgery. The splendid open orthopedic work of Ryerson, especially in muscle transplantation for infantile paralysis, is unexcelled, while the work of Albee in Pott's disease has gained world-wide recognition; but these achievements are only fractional parts of progress made in their field. Hibbs (38) reports eight patients with deformity of the spine following poliomyelitis in which he did a fusion operation similar to that done for Pott's disease. All of the patients showed improved posture, more stability and prevention of increased deformity and were spared the necessity of indefinitely wearing a brace. Ryerson (74) in a case of paralysis following anterior poliomyelitis in which the quadriceps extensors of both thighs were paralyzed transplanted the semitendinosus and long head of the biceps from their tibial in-

sertions to the tendon of the quadriceps extensor at the patella with satisfactory results.

Congenital hip dislocation treated operatively is reported by Ridlon, Roederer, Lance, Allison and Dixon, and others. Ridlon (69) finds that it occurs most often in girls. In the treatment he grasps the flexed knee with one hand and with the other seeks the great trochanter and the neck and head of the femur, placing the thumb in front below the spine of the ileum. The femoral head is then pushed down to a position opposite the lower part of the rim of the socket. The thigh is abducted while the opposite side of the pelvis is held down firmly by an assistant. The head can be felt by the operator passing forward into the socket. When the limb is in good position, a plaster cast is applied. Ridlon finds that backward and upward dislocation gives 60 per cent perfect results; directly backward, 60 to 70 per cent; and upward displacements 50 per cent perfect results.

Roederer (71) and Lance (49) recommend the very early reduction of congenital hip luxations. Lance operated upon twenty-one patients under two years of age with good results. Allison and Dixon (2) treated twenty cases, six bilateral and fourteen unilateral. The ages varied from eighteen months to eight years. The operative methods used were the forcible traction on the Bradford device, with sometimes the Lorenz forced abduction. Results in all cases were good. The open method used on some older patients did not give such good results as the closed.

In tubercular cervical adenitis there is a very noticeable increase in the number of surgeons who look upon the tonsils as the usual seat of primary infection, and many insist that a very large percentage of glands not badly damaged show a subsidence of the active process and remain permanently well from a clinical point of view after the removal of the tonsils. Other mouth lesions should be cared for. They believe that tonsillectomy should be routinely done as a part of any surgery directed toward the cure of tubercular cervical adenitis.

Dowd (21) reports on the treatment of tuberculosis of the cervical lymph-nodes by operation. His study is based on 678 cases observed within twenty-two years. Of these, 432 were in the state when the process was strictly local. Ninety-one per cent of these patients treated were apparently cured when last seen and Dowd thinks the results eminently successful. Sixty-eight and two tenths per cent of patients with glandular abscess or glandular enlargement were apparently cured, and 35 per cent of these where there was evidence



of tuberculosis in other parts of the body. In the operation all enlarged glands are entirely removed. In the discussion Ladd (47) reported 93 per cent apparent recoveries in 160 operated cases followed from six months to five years.

The almost uniform death of children under one year of age suffering from empyema still confronts surgeons. The subject needs badly the combined concentrated attention of reliable laboratory and clinical investigators. The fatality diminishes with each year after the first. Bremmmerman and Krost have treated seven patients having empyema by aspiration alone, repeating it as soon as the heart became dislodged laterally more than half an inch, which usually occurred in three or four days. They found that in about three weeks the patients with pneumococcic empyema seemed to have a crisis and the thorax did not perceptibly refill. Two of the patients finally required drainage and one of these died. The others are still living. Three have been followed and there are no demonstrable chest changes. Five of these children were between one and two years, while two were under one year of age. Their work is as yet unpublished.

Buford in a few unreported cases repeatedly aspirated pus from the pleural cavities, replacing it with air in some and sterile alboline in others. For a time with each aspiration there was a diminished amount of pus, and the outlook seemed hopeful, but each child finally died of toxæmia or required drainage. Greer (31) treated an interlobar empyema in a boy of five years by artificial pneumothorax with good recovery.

There is still a wide difference of opinion as to whether intercostal incision or rib resection should be done in young children for empyema. Charles Parker collected about forty cases operated upon at the Children's Memorial Hospital showing the death rate to be about equal in the two procedures. In such an analysis the age of each group and their relative prospects for recovery on account of the known age risk should be taken into consideration. The time element in the operation must also be considered. It has been shown that rib resections for empyema may be done in three minutes. In two cases of pyopneumothorax in children of three and one-half years and one and one-half years respectively which Bertoldi (5) operated upon, resection of the seventh rib was followed by death. Pleurotomy gave a similar result.

Weil and Loiseleur (85) having observed the beneficial effects of injections of air in pleural effusions applied this method in a case of tubercular pericarditis with extensive effusion in a boy

of fourteen years. The pericardium was repeatedly punctured and serosanguinous fluid withdrawn. The punctures were later followed by injections of air which were repeated. After several treatments radioscopy showed the pericardial cavity quite clear. The authors claim very excellent results from this method. The creation of artificial hydropericardium and pneumopericardium is not followed by untoward results.

Among the abdominal surgical affections of infancy, that of congenital pyloric stenosis for the present exceeds all others in surgical interest. There is no doubt but there is a rapid increase in the number of patients in whom this affection is recognized, and an increase in the recovery rate. The latter is due in part to the improving skill of surgeons in doing gastro-enterostomy for infants on the one hand, and the wider use of the Rammstedt operation on the other. In performing the Rammstedt, the greatest care must be taken not to puncture the mucosa, an accident which has occurred repeatedly in the hands of some of the best workers when doing their first Rammstedt.

There have been several ingenious operations advocated, directed toward the restoration of the severed pyloric ring, eminently that of Strauss. Among the most robust children the author has seen are those on whom only a division of the pyloric ring was done and the muscle stripped back from the underlying mucosa which then pouts between the cut surface of the ring, allowing the stomach to freely empty itself at once. These patients must be weighed daily and the greatest care exercised in after-feeding. When possible their feeding should be directed by a pediatrician. The author feels that this point cannot be sufficiently emphasized.

Many who lately supported gastro-enterostomy for congenital pyloric stenosis are now abandoning it and doing the Rammstedt operation, which certainly requires much less time to perform, and is therefore of great advantage. The temporizing treatment still has some advocates. In view of the present knowledge it ought not to be attempted except under the supervision of the most experienced pediatricians. It is more uncertain as to its outcome and at best often leaves a very badly nourished child with a poor future prospect of becoming a sturdy adult.

Grulee and Lewis (32) review the whole subject and report in detail on fifteen congenital cases operated upon during the past six years by gastro-enterostomy. Their mortality was twenty per cent. They think that a diagnosis of congenital pyloric stenosis is an indication for operation.



The former high mortality has been much reduced of late. As recently as 1906 the mortality was above fifty per cent. They prefer the posterior no-loop gastro-enterostomy to the Rammstedt pyloroplasty inasmuch as it is shorter in execution and there are fewer postoperative complications.

Gallie and Robertson (27) had a mortality of 31.2 per cent in sixteen cases operated upon by the Webber-Rammstedt method. Downes (22) reviews sixty-six cases of infantile pyloric stenosis operated upon. Thirty-five were Rammstedt operations with a mortality of 23 per cent. Thirty-one had a gastro-enterostomy with a mortality of 35 per cent. The author, in view of the results, prefers the Rammstedt operation as simple and one which leaves the gastric tract intact. Strauss (80) gives the details of a new method of pyloroplasty, as he thinks posterior gastro-enterostomy is too severe an operation in the majority of these cases. The incision is small and is supra-umbilical. The pylorus is drawn into the wound and the hypertrophied musculature separated from the mucosa. Strauss claims that his method has many advantages over others. Posterior gastro-enterostomy gave good results to Howell (41) in five cases out of six operated upon.

Extensive gut resections for intussusception have been reported by Fraser (26) and Brockway (8). Ladd (48) gives the statistics of intussusception at the Boston Children's Hospital since 1908. Before 1908 only eight cases of intussusception were operated upon; since 1908 sixty-three cases, with thirty-two recoveries. The mortality is just under 49 per cent. The statistics clearly show that the success is much greater according as the cases are diagnosed and operated upon early. Thus, four cases diagnosed and operated upon within twelve hours all recovered; seventeen cases operated upon after sixty hours gave a mortality of 88 per cent. Apfel (3), Torrance (81), Jopson (42) and Peskind (63) also report successful operations for intussusception in very young infants. In Jopson's case more than 15 cm. of the intestine were removed. Peskind performed an ileocæcostomy.

Wood, Stephens, Rivarola, Willitts and Judell, and Kirrison report on appendicitis in young children. Wood (87) operated in thirty-one cases of children followed by the Fowler position and Murphy drip method. All gave good results. Stephens (78) in an infant of three weeks found an appendicitis development in the sac of an inguinal hernia. Rivarola (70) from his experience in acute appendicitis thinks that after the

acute crisis, when the case has become apyretic, it suffices to do lavage with ether and close the abdomen without drainage. He mentions six cases of children treated in this way with good results. Willitts and Judell (86) operated in forty-four cases in children under fourteen years of age. They found that delayed operations lead to abscess in the great majority of cases; that more rapid recovery occurs when the appendix is removed in abscess cases, and that the peritoneum of the child is more resistant to infection than that of the adult. Of their forty-four cases, twenty-four had abscess formation; they express the opinion that early abscess formation is probably due to the higher location of the appendix in the child. Kirrison (44) apropos of two cases of gangrenous appendicitis operated upon in children draws attention to the great value of cutaneous hyperæsthesia in the right iliac fossa as diagnostic of this condition.

Cadwallader (12) and Hamann (33) report operations for Hirschsprung's disease. Cadwallader's case was in a boy of nine years. The upper sigmoid, descending colon and part of the transverse colon were resected and an end-to-end anastomosis made. The boy recovered. Hamann had two cases in boys of fifteen and two and one-half years respectively. In the first an artificial anus was created after resection with recovery. In the second case ten inches of large intestine were resected. This patient died from peritonitis.

Wakely (84) did a gastrotomy in a baby of six months for a foreign body swallowed. The child was in excellent condition three weeks later.

Holmes (40) says that congenital obliteration of the bile-ducts is not very rare. Sixteen per cent of the cases reported show that the anatomical relations are such that surgery can afford relief. An artificial passage to the duodenum can be made.

Ernst (24) in a child one year old did a duodeno-entero-anterior anastomosis for congenital atresia of the duodenum. The operation lasted one and one-fourth hours and was well borne, the child having taken 35 gm. of ether. The patient recovered.

Bookman (6) in an urgent laparotomy done on a child of six years for traumatism found extensive laceration of the right coronary ligament of the liver with considerable blood in the abdomen. The laceration was repaired and the wound closed without drainage. The child recovered.

Kirrison (45) draws attention to the accidents due to a Meckel's diverticulum. In treating a child with such, Kirrison usually operates in two stages, removing the diverticulum and bury-

ing the stump. Several cases in young children treated thus have given good results.

Graham (30) gives a good review of the results of splenectomy for Banti's disease and reports a case. Other cases have been reported in recent literature.

Tweed (82) sutured a perforated gastric ulcer in a girl of fifteen years. Peritonitis had set in. The girl recovered. This author states that few cases occur under the twentieth year.

Vargas (83) reports a malformation described by Ballantyne under the name of gastroterata or gastroschisis in which the abdominal wall was lacking and the viscera contained in the cavity herniated. The umbilical and peri-umbilical regions were covered, not by skin as normally, but by a whitish gelatinous substance identical with that forming the umbilical cord. There was no other malformation. The infant was brought to Vargas' clinic twelve hours after birth. He proceeded to operate immediately after making sure of hæmostasis in the umbilical cord. His first intention was to draw the skin edges together over the defect by sutures without disturbing the gelatinous covering, but after tying several sutures a rupture occurred and the intestines herniated. The author had much difficulty in reducing them and was obliged to cut his previous stitches.

In the herniated intestine the appendix was seen 3 cm. long, and in accordance with his usual rule, he extirpated the presenting appendix and invaginated the stump. Having performed the appendectomy, the author restored the organs to the cavity, cut away the gelatinous abdominal cover and then proceeded to suture. The peritoneum was first sutured, then the muscular and cutaneous coats drawn together, leaving a cicatrix 7 cm. long. The operation was performed under chloroform and ether narcosis. After ten days the child was in normal condition.

Vargas gives a historical sketch of congenital malformations of this type. Ballantyne only mentions sixteen, but the author has himself seen five, of which he gives short particulars. These include the present case. In one other case in which he operated there was surgical success although the child succumbed later to bronchopneumonia. The only treatment is immediate operation. Kocher has published a list of twenty-four operated cases with recovery. Vargas remarks that this is the only reported case in which an infant so young had a successful appendectomy. Hallet has published a list of fifty-eight cases in which infants were operated upon within thirty-six hours of birth with fifteen deaths.

Ochsner (58) thinks that only seven per cent of

herniæ in children require operation and approximately 95 per cent of all cases of hernia will heal if abnormal intra-abdominal pressure is relieved and the hernial sac is kept empty. The latter can be affected by trusses. Operation is indicated: first, in strangulated hernia; second, in irreducible hernia due to adhesions; third, in cases where the opening is unusually large in a free hernia; fourth, in reducible hydrocele; fifth, in cases with undescended testicle unless they show a tendency toward spontaneous cure.

Brossy (9) makes an extensive review of inguinal hernia in young children based on three hundred and thirty-three cases operated upon from 1888 to 1905 in the Children's Hospital at Lausanne. As a result of experience and based upon the operative end-results, Brossy strongly recommends the complete radical operation for inguinal hernia. The results are better in children than in adults, and are better the earlier the operation is done. Of the three hundred and thirty-three operated, the radical operation gave two hundred and forty-seven recoveries remaining permanently cured nine years after operation. There were only seventeen recurrences. Petit de la Villeon (65) removed a hernial sac 7 cm. long from a child two months old with congenital inguinal hernia. He followed the technique of Lorthoir of Brussels, i.e., removing the sac without opening the inguinal canal.

Eisendrath (23) recommends that cases of true non-descent or ectopic descent of the testes should be operated upon at as early an age as possible, the early limit being about two years, as atrophy of the spermatogenic cells occurs in about 90 per cent of the cases.

The following are among the most interesting tumors reported in infants and young children: Adams (1) while operating upon a child of two and one-half years found a tumor of the uterus adherent to the bladder in the retrovesical space. Only part could be removed owing to adhesions. The tumor was a glandular carcinoma. The child died. Simmons (77) did a radical operation on a boy of thirteen years for adenocarcinoma of the breast, the result of traumatism. Harris (34) in a girl of eight years with premature sexual development found on laparotomy an ovarian carcinomatous tumor weighing 1,928 grams. He removed the tumor. The child recovered.

Martin-du-Pan (55) in a case diagnosed as encysted peritonitis in a child aged eight found a pedunculated mesenterial tumor which proved to be a tuberculoma. The child recovered. De Concillii (18) in a child of nine years found a multi-locular lymphatic cyst of the mesentery. There



were two sacs. The transverse colon prevented complete extirpation. The child died. Chiavallotti (14) removed a fibromyxosarcoma of the mesentery in a two-year old-boy. The child died within twenty-four hours. Craglietto (15) in operating upon a child of three months for an abdominal tumor found a congenital teratoid which was connected with the sacrum. It was enucleated and recovery followed. Higgins (39) removed an ovarian sarcoma from a girl of five years. Both ovaries were involved and removed. The sarcoma weighed 1,578 gr. The child recovered. Goodman (29) removed a large lymphosarcoma found in the sigmoid. The child, however, died four days later.

Dauriac (17) reports a total gastrectomy for a hairy tumor of the stomach, making a direct anastomosis between the oesophagus and duodenum. This was in a girl of thirteen years; she made an excellent recovery and remains in a very good condition. Broca (7) reports a somewhat similar case in a child of three years in which gastrotomy was done with good results.

De Villa (20) operated upon a boy of four years for malignant tumor of the kidney. The tumor ruptured during operation and detritus escaped into the peritoneum. Seven months later the mesenteric glands were observed to be swollen. The boy died. The tumor was a sarcoma. In the author's clinic six similar cases have been operated upon with recovery. Kirmisson and Tretiakoff (46) removed a large adenosarcoma with nephrectomy of the right kidney in a girl aged six years, with subsequent recovery. The tumor weighed 920 gr. Lorca (51) on doing a laparotomy in a girl of ten years found a cystic tumor of the kidney with hydronephrosis. Marsupialization was followed by recovery.

O'Neal (59) reports some rare cases of bladder neoplasms in children which he operated upon. Bladder tumors do not occur often in the very young and the only hope of recovery is through early diagnosis and operation. Both Loumeau (52) and Perrier (60) successfully performed nephrectomy in young children for uronephrosis.

Morse's paper (57) is timely and most important. Much confidence must always be given to whatever he has to say concerning the diseases of childhood. He reviews twenty-three cases of nephritis in children in which Edebohl's operation was done. As a result of the operation, two of the cases have apparently been permanently cured, one being well after nine and the other after eight years. One patient died from acute nephritis two years after operation, but this nephritis was not connected with the previous

one. Two patients have been well for as long as observed, but the time is not sufficient to pronounce a definite cure. Nine are much improved after operation. Morse thinks that the operation is valuable in properly selected cases of nephritis in children. It may prolong life for a considerable period. No child with acute nephritis should be allowed to die without the chance offered by operation. Burns (11) found double kidney decapsulation to give satisfactory results in nephritis in a girl of six years.

Cumston (16) reports the occurrence of urethral calculi in a boy of eight years in which he performed ureterotomy and ureterorrhaphy with uncomplicated recovery. He thinks that the extraperitoneal operation is the only logical one, and also that Gibson's technique for exposing the ureter low down is very advantageous in the case of children. Multiple urinary calculi with successful operation is also reported by Pybus (68). In this case, a boy of ten years, a large stone in the upper end of the ureter as well as one in the right kidney were removed.

Mayo (56) states that thirty-seven patients with exstrophy of the bladder were observed since 1896. Many were too young to be operated upon. Six were treated by plastic methods with one late death. Three were treated by the Maydl-Moynihan method with two operative deaths. Thirteen cases were successfully treated by the transplantation method with only one operative death. Most of the patients were apparently children.

Stevens (79) did a successful implantation of the ureters into the rectum in a child with exstrophy of the bladder. The child is in good condition five years later.

Rollier (72) continues to report on the extremely favorable results obtained by treatment of surgical tuberculosis in children by exposure to the sun at high altitudes. More than twelve years' experience convinces him that this is the treatment for osseous, articular, ganglionic and peritoneal manifestations of tuberculosis. It not only cures but confirms the cure. It is particularly efficacious in the case of children. Orthopedic appliances are used as a supplement to the sun cure.

Buford (10) discusses the field of pediatric surgery which he states offers a variety of work and a fertile field for research and human benefaction. He points out the high fatality among infants subjected to surgical operations, and some of the reasons for it. Reference is made to the need of preparation of relatively larger fields of operation in children and of better after-care.

Attention is called to the need of small laparotomy sheets and sponges. He discusses at some length circumcision, umbilical and inguinal hernia, congenital pyloric stenosis, and bone affections. Goiter in childhood is briefly discussed. A toxic syndrome, referred to in his paper on "Goiter in Children," and the uniformity of hypertrophied tonsils in goiter patients are points still supported by him. He is not operating upon many children for goiter *per se*, but has the focal infections removed and puts them on iron or thyroid feeding or both and symptomatic treatment. Attention is called to the rarity of enlarged cervical lymph-nodes accompanying tonsillar hypertrophies in goiter subjects.

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## THIRD INTERALLIED SURGICAL CONGRESS FOR THE STUDY OF WAR WOUNDS<sup>1</sup>

(COMPTES-RENDUS DE LA CONFÉRENCE CHIRURGICALE INTERALLIÉE POUR L'ÉTUDE DES PLAIES DE GUERRE)

THE Third Interallied Surgical Congress, held at Val-de-Grâce, France, November 5 to 8, 1917, was the first of these Congresses in which American surgeons have participated. The following officers were present: Colonel Winter, Lieutenant Colonel Siler, Lieutenant Colonel Keller, Majors Harte, Blake, Finney, Peck, Brewer, Hutchinson, and Lieutenant Davison. All the interallied powers were represented.

The first work of the Congress was the discussion of proposed modifications of some of the conclusions arrived at in the previous congresses. These discussions covered the following questions:

1. The general principles of the treatment of war wounds (Tuffier and Duval).
2. The technical surgical organization of the French Army Service (Duquet).
3. The use of bacteriology in war surgery (Veillon).
4. Serotherapy in the treatment of gaseous gangrene (Sacquépée, Sir Almroth Wright and Fleming).

5. Traumatic shock (Bowlby, Tuffier, Tanton, Govaerts, DePage, and Duval).
6. Amputations (Duval).
7. Prosthetics of the mutilated (Jacob).
8. Surgical treatment of fractures (Duval, Tuffier, and Bowlby).
9. Treatment of articular wounds (Gosset).
10. Brain injuries (Tanton, Guillain, Tuffier, and Jacob).
11. Infection of war wounds (Wright).
12. Penetrating wounds of the chest (Duval, Tuffier, DePage, and Bowlby).

The second part of the Congress was occupied with the consideration of new questions submitted:

1. The treatment of chronic osteomyelitis.
2. The treatment of articular fractures.
3. The end-results of the treatment of thigh fractures.
4. The treatment of the secondary and late complications of war wounds of the brain.
5. Operations on the peripheral nerves and their end-results.
6. Thoraco-abdominal wounds.

## RECONSIDERATION OF FORMER CONCLUSIONS

In regard to the general principles of the treatment of wounds, TUFFIER pointed out that the principal recent innovation in war surgery was toward mechanical disinfection and primary suture. When this was done within twenty-four hours there was 80 per cent success. After forty-eight hours there was 64.5 per cent success. Secondary suture in general has given about 90 per cent success. But with primary suture hospitalization has been reduced to from twenty to thirty days.

DUVAL dealt with delayed primary suture. Wounds which, owing to the lack of hospitalization, etc., could not be sutured at the front formations were evacuated to a rear hospital and immediately sutured on arrival, unless infected. It has been found that 80 per cent of such

evacuations after a primary operation at the front are suturable.

SACQUÉPÉE reported that the results of trials of sera prepared against the presumed agents of gaseous gangrene were good, both as regards prophylactic and curative effects. Particulars will be given in the conclusions.

WRIGHT and FLEMING hold that the condition which favors the development of the gaseous gangrene microbe is reduced alkalinity of the blood; that acidosis is the principal factor, and that the microbes themselves aid in the elaborations of the acids which reduce the alkalinity. They give tables to show the excellent results obtained from the intravenous injections of sodium salts, lactate of sodium or 5 per cent bicarbonate. They claim that cases inoperable

<sup>1</sup>Arch. de méd. et pharm. mil., Par., 1918, lxi, No. 1, 2.

owing to acidæmia become operable after alkaline injections.

In discussing a paper by SIR ANTHONY BOWLBY on traumatic shock, TUFFIER said that there were three pathological conditions confounded under the name of shock, namely, hæmorrhages which provoke a state of shock, severe intoxications or infections which simulate shock, and true shock absolutely independent of the other two conditions. In hæmorrhages blood transfusions give very favorable results; but in true shock, transfusions give either no or only transitory results. The therapeutic indications must depend on an exact diagnosis of the pathological condition.

GOVAERT's paper dealt with the indications for transfusion, which he pointed out rested on the fact that within the first six hours after wounding the red corpuscles in the blood fell below 4,000, 000. Transfusion then finds an absolute indication and the life of the patient can be saved with but little danger to the donor.

TUFFIER reiterated that no case of true shock has been saved by transfusion nor by any other known therapeutic method.

DUVAL reported that since the previous congress real progress had been made in the French army in the surgical treatment of fractures. At that time the question of primary suture of diaphyseal fractures was scarcely discussed; but there has been a change since. At present, as many diaphyseal fractures as possible are sutured directly and immediately. Only shell fractures are dealt with here. During the battle of Flanders 51 per cent of the diaphyseal fractures of the thigh, leg, and arm have been primarily sutured and have given 83 per cent of perfect results. Ninety per cent of forearm fractures primarily sutured have given 100 per cent success. Of humerus fractures 80 per cent, of leg fractures 60 per cent, and of thigh fractures 20 to 25 per cent have been primarily sutured.

DUVAL reported on the recent progress in the surgical treatment of penetrating chest wounds. The tendency is now toward active treatment, i. e., excision of the injured tissue of the lung or pleura, extraction of foreign bodies, suture of the lung, toilet of the pleura, and total closure. During the recent battles of Flanders and of the Aisne, Duval treated 161 chest wounds, the total in his sector. Thirteen died without any intervention; 29 were treated for threatening hæmorrhage, of which 13 died immediately; 33 were systematically operated upon with no deaths; 101 cases were medically treated, with 1 death. In the total of 161, therefore, including the immediate dead, the

whole mortality was only 16 per cent, and if the 13 cases without possibility of treatment be excluded, then the mortality is reduced to 8.7 per cent, which certainly shows incontestable progress as regards chest wounds.

WRIGHT, from his investigations regarding the emigration and bactericidal effects of leucocytes, said that the position of the bacteriologist toward the surgeon ought to be changed. In the present conditions the bacteriologist makes a "necro-pyoculture," to know how many live microbes can be found in the pus, and on this finding the surgeon is guided in making secondary suture of an infected wound. It seems to Wright that the bacteriologist should instead make a "bio-pyoculture" and inform the surgeon if the leucocytes of the surface of the wound are capable of destroying the infection which subsists in the wound.

#### MODIFICATIONS OF CONCLUSIONS

1. *Disinfection of wounds.* Since the last Congress the disinfection of wounds has more and more passed from the domain of chemical disinfection to that of surgical mechanical disinfection. Primary suture has succeeded secondary suture of wounds as a general method.

This primary suture has become the method of choice. It has been practised either at once or as a retarded primary suture (early secondary). It seems that immediate primary suture can be done beyond the limits of time which had been fixed in the case of slight wounds. Delayed primary suture is done in two stages: The first stage consists in mechanical sterilization by excision of the wound, followed by an aseptic or antiseptic dressing; the second stage done from one to four days later is the complete closure of the surgical wound after bacteriologic examination. Among the germs whose presence causes acute severe complications after suture, the streptococcus and the anaerobes, especially the spore-bearing anaerobes, must be given the first place.

2. *Use of bacteriology in war surgery.* The laboratories in connection with the surgical units have been of immense service to surgical technique. They should be perfected from the viewpoint of personnel and material.

Under actual conditions it would be premature to give any concise bacteriologic formula as an indication for the closure of wounds. It is suggested that periodical meetings of the bacteriologists of the different surgical units be held and methods and results discussed for common benefit.



3. *Treatment of gaseous gangrene.* Owing to acidosis, in certain cases of gaseous gangrene an alkaline treatment has been instituted either to permit an ulterior operation in inoperable patients or for disintoxication. This treatment has given encouraging results and it is recommended that new trials be instituted. A certain number of the wounded have been treated by different specific sera: anti-perfringens serum, anti-vibrio-septic serum; anti-bellonensis serum. These three sera have proved harmless. The anti-perfringens serum, used as a preventive in a number of cases, seems to have given favorable results. From a curative point of view the study must be continued. The anti-vibrio-septic and anti-bellonensis sera have given very appreciable results both from preventive and curative standpoints, even in toxic cases far advanced. From these results it would seem advantageous to continue their application.

4. *Shock.* Since the last session the treatment of shock has been modified. In shock three processes must be distinguished: (1) hæmorrhage; (2) infection or supra-acute intoxication; (3) true shock.

It is difficult to distinguish these three states. Count of the red corpuscles in the venous blood done in the hours immediately following injury, taking into account the time elapsed since the traumatism, permits the existence of an important hæmorrhage to be recognized. The results furnished by this method are not applicable to limb wounds, but a marked fall in the red corpuscles indicates a severe hæmorrhage. In such circumstances blood transfusion has been successful. In true shock, warming the patient is the essential element of treatment. It is desirable that all beds allotted for shocked patients should be heated. British surgeons in treating shock employ intravenous injections of solution of bicarbonate of soda, 4 per cent, in doses of 500 ccm. Other saline solutions have not given definite results.

The operative indications in shock, as established in the last Congress, should be adhered to.

5. *Prosthetics of the mutilated.* Experience during recent months has confirmed the superiority of apparatus of rigid material (of which that named "American" is the type) over apparatus of reinforced leather when the stump has terminated its evolution. Temporary apparatus, used when the conditions of the amputation wound permit, considerably hastens the maturity of the stump.

6. *Surgical treatment of war fractures.* The surgical treatment of war fractures has made

very great progress: first, in organization, which includes distribution of the wounded from the first aid post in apparatus such as the Thomas splint to secure immobilization; direct evacuation from the first post to operating centers; multiplication of specialized operating centers; perfect accord between the different services, which permits absolute unification of the treatment in its different stages; secondly, in operative technique. Primary reunion of diaphyseal fractures has been the current practice. The present average is about 51 per cent of diaphyseal fractures, due to shells, primarily united. The following principle seems to be evolved: to transform an open war fracture into a closed fracture, either by immediate primary suture or by delayed primary suture under bacteriologic control. Secondary suture after chemical disinfection, bacteriologically controlled, still preserves all its indications.

7. *Articular wounds.* At the present time, complete closure is the universally admitted procedure for articular wounds. Its results are such that when the excision of the contused tissues creates extensive cutaneous losses, the breach can be filled by autotransplants. Bone cavities can be filled in certain cases by pediculated muscle flaps.

8. *Chest wounds.* The surgical treatment of chest wounds clearly tends toward active surgery. Threatening hæmorrhage and open thorax are regularly operated upon. Intrapulmonary projectiles are primarily extracted with direct treatment of the lung wound, according to the general principles of the treatment of war wounds: treatment of the parietal wound, excision, removal of all pulmonary foreign bodies, bone or metallic, cleansing of the wound, and immediate closure of the thorax. The success obtained clearly authorizes this surgery.

Infected hæmothorax is treated by very early drainage, progressive disinfection, and secondary closure of the thorax.

Chronic purulent pleurisies are amenable to progressive sterilization with pleuropulmonary liberation by multiple incisions if necessary.

9. *Craniocerebral wounds.* Wounds of the brain are mechanically disinfected by trepanation, followed by cerebral lavage with warm saline, and extraction of easily accessible projectiles. Bacteriologic control, here as in all infected wounds, indicates the possibility of complete closure. In cases where the foreign body cannot be extracted, primary closure, either immediate or deferred, should only be done with extreme prudence. The greatest circumspection should be observed in the application of plastics.

## CONSIDERATION OF NEW QUESTIONS

## TREATMENT OF CHRONIC OSTEOMYELITIS

Papers were submitted by JACOB, MAKINS, and CONRAD, dealing with the methods and spread of infection in the bone and the operative treatment. After discussion the Congress adopted the following conclusions:

1. Osseous infection is produced by the same mechanism as infection in other war wounds. It spreads in two ways: (a) from place to place through the medullary and compact tissue; (b) to a distance along fissures. Penetration through the bone tissue is generally slow and limited.

2. Among the germs which first penetrate may be cited: the streptococcus, the staphylococcus, the enterococcus, more rarely the anaerobic organisms. In subacute or chronic bone suppurations is most frequently found the streptococci, staphylococci, enterococci, and pneumococci.

3. The treatment of chronic osteomyelitis is especially preventive. It consists of nothing else than the treatment of the fracture area. (See the conclusions of the previous Congress on the treatment of fractures).

4. The treatment of established osteomyelitis is at the present time purely surgical. It ought to be early. It consists essentially in: (a) wide opening up of the area; (b) minute search for and removal of all sequestra and foreign bodies; (c) eradicating and leveling all cavities.

5. After these operations there are two courses open: (a) either immediate closure of the wound, the latter being filled by autoplasmic strips; (b) or by chemical sterilization of the wound, secondary autoplastics to fill the osseous cavity, and then suture. The latter method is more general.

JACOB reported that Chutro by adopting the complete extensive operation in 50 established cases had obtained 50 recoveries and that in his own series of 42 cases 38 had left the hospital cured and the other 4 were advancing toward cicatrization.

## TREATMENT OF JOINT FRACTURES

WALLACE thought it was of prime importance in articular wounds to isolate the synovial cavity as completely as possible early in the treatment and to suture immediately wounds of the surrounding soft parts. Experience has shown that the synovial membrane possesses the power of neutralizing infection to a much higher degree than the surrounding soft parts.

There are certain modifications to be observed according to the extent of fracture or injury of the bones of the joint.

TANTON thinks that in all articular wounds except those due to bullets, surgical intervention is indispensable. In primary treatment of articular fractures the indications are: Comminuted fractures are opened up, cleansed, and primarily sutured. Partial epiphyseal or epiphyseometaphyseal fractures are treated by arthrotomy with economic opening up of the joint and followed, if possible, by primary suture. Total and complete epiphyseal fractures, when the lesion is limited to the articular epiphysis properly so-called, are treated by economic and semi-articular resection. Resection is also called for in very comminuted epiphyseometaphyseal and diaphyseometaphyseal fractures; also when only one articular extremity is injured. Crushing injuries with vascular and nerve sections call for amputation.

When a primary operation has not been done for any reason and the condition is one of superacute arthritis with gaseous infection, gangrene and septicæmia, an immediate high amputation is indicated. An early secondary amputation is called for when arthrotomy or some other procedure has failed to arrest infection and this has progressed to a threatening degree. When drainage is indicated, an early secondary resection will accomplish it better than arthrotomy. This operation is especially indicated in severe infected osteo-arthritis.

WILLEMS referred to his original treatment of articular fractures by immediate active mobilization after preliminary surgical cleansing. The active movements are commenced within a few hours after intervention. He reported sixteen patients treated in this manner for various types of articular wounds. He claims that immediate mobilization perfectly realizes articular drainage and obviates arthritis and ankylosis.

After discussion the Congress arrived at these conclusions:

1. The aseptic progress of osteo-articular wounds operated upon within ten to twelve hours after injury suggests that the surgical treatment of articular fractures should tend toward maximum conservation.

2. Epiphyseal or epiphyseometaphyseal comminuted fractures call for opening up, curretting, and primary closing of the articulation.



3. Partial or T-epiphyseal or epiphyseo-metaphyseal fractures call for arthrotomy with replacement or an economic esquillectomy (atypical partial resection) followed by primary suture.

4. Active immediate mobilization appears to be the indispensable complement of the operative treatment and seems to have given results superior to immobilization.

5. Primary resection is only exceptionally indicated: (a) In osseous lesions it will be limited to very comminuted fractures of the articular extremities, but its indications are wider in the case of the hip and shoulder than in the knee, elbow or instep; (b) the practice of primary resection with a view to obtaining a better functional result ought to give way to conservative methods, either an arthrotomy with esquillectomy, or a typical partial resection. The defective functional results can be remedied by a later orthopedic resection, which is generally superior to that of primary resection.

6. Primary amputation is indicated in crushing injuries with destruction of the main artery.

7. Resection is indicated in infected articular fractures.

#### FRACTURES OF THE THIGH

DEPAGE stated that prior to the installation of the Carrel method in his ambulance service, 65 cases had been treated. These were cases surviving more than forty-eight hours and without shock or anæmia. There were 37 deaths; 17 amputations (12 for gangrene, 3 for hæmorrhage, 2 for infection); in 33 cases the limb was preserved, but as a general rule the functioning was mediocre. Forty-three cases treated since the introduction of the Carrel method have given 2 amputations for gangrene; 1 disarticulation for infection; and 40 recoveries. Fifteen of these have rejoined the colors; of the others only 4 are definitely unfit. The method followed is surgical clearance, resection of all contused tissue, and secondary suture as early as possible under bacteriologic control.

MAX PAGE dealt with the end-results of treatment by immobilization and extension in the British hospitals. In general, shortening of the limb is about one and one-half inches. In the majority of fractures of the upper part of the femur the superior fragment remains in a position of flexion and abduction. In about 75 per cent of fractures of the lower part of the femur there is flexion and displacement of the lower fragment. In general, the muscle functioning is bad, particularly that of the extensor quadriceps. This is probably due to long immobilization.

TUFFIER dealt with the end-results of fractures of the femoral diaphysis only. From official sources he finds that since the beginning of the war up to the end of 1916 there were 16,392 men invalided on account of thigh fractures. This was the most disastrous period of treatment and the results were particularly unfavorable.

Infection of the wound and the osseous area involved ranks as the chief cause of the defective end-results causing secondary osteomyelitis, preventing consolidation and correct alignment, and producing vicious consolidation, vicious cicatrization, and all the functional complications resulting from them. Shortening which is due to the extent of the traumatism is the least serious of the bad end-results.

These results can be and are now being notably improved. Primary or secondary closure of these fractures suppresses all complications due either directly or indirectly to osteomyelitis; it shortens the duration of the treatment and will reduce the complications of invalidism in more than 75 per cent of these cases; it will also enable the surgeon to devote his attention to orthopedic measures.

The reports gave rise to a very animated discussion, after which the Congress adopted these conclusions:

1. In a general way the end-results of the treatment of thigh fractures have been mediocre. This has been due to the extent of the lesions, to insufficiency of the methods of reduction and retention, and especially to infection of the area.

2. The end-results of fractures of the upper third and especially of the lower third of the femur leave the most to be desired.

3. The end-complications most frequently resulting are: (a) infections under the form of chronic osteomyelitis; (b) deformities due to incomplete reduction; (c) less frequently defects of consolidation or functional impotence of articular, muscular, or nervous origin.

4. Shortening is the most frequent deformity and the only one which is not always avoidable.

5. Rotation and angulation are most frequently due to insufficient surgical attention.

6. Primary sterilization is the principal end to realize. Its insufficiency is the essential cause, direct or indirect, of the defective results. The slowness of the treatment of prolonged infections makes retention of the fragments difficult.

7. Primary suture of the wound and secondary suture after cicatrization by transforming an open into a closed fracture have a special influence on the end-results of the treatment of thigh fractures.

8. The very frequent articular stiffness in the knee, hip, and foot, either isolated or associated, can be prevented by early mobilization.

9. Muscular adhesions to the callus are the origin of numerous functional disturbances which may call for surgical liberation.

10. Trophic disturbances, i.e., muscular atrophy, œdema, and vasomotor disturbances, play a very important rôle and should be the object of early and persistent attention.

11. Very marked deviations, with or without osteomyelitis, call for osteotomy. In the case of a concomitant osteomyelitis, resection of the callus is generally indicated.

TREATMENT OF THE SECONDARY AND LATE COMPLICATIONS OF BRAIN WOUNDS

HOLMES' statistics were based on the examination of 2,357 cranial gunshot wound cases treated in the hospitals of Great Britain. In 1,567 of these cases the secondary complications could be studied at a period varying from three months to two or three years after injury. There were 37 cases of secondary abscess after recovery, 28 of which terminated fatally, 9 of them immediately after operation.

In 90 cases of gross cerebral hernia, there were 70 complete recoveries and 20 deaths. It is the general rule of British surgeons not to intervene surgically in such cases, as the results have been unfavorable.

A large number of these cases had large losses of cranial substance, but practically none complained of symptoms which could be attributable to the breach. In only 8 cases was a plastic operation done. A temporary metallic protector is preferred.

Of 164 cases with bullets or shrapnel fragments in the brain examined within two to three years, 12 have died. Abscess is the most important complication in this kind of case. Nine of these had one or more epileptic convulsions.

TUFFIER and GUILLAIN find that in 4,262 old trepanation cases hospitalized in various neurological centers there were 770 hemiplegias, 206 monoplegias and 200 aphasias, occurring in 18.06, 4.83, and 4.69 per cent respectively.

In a total of 6,664 such cases the authors find the following late complications of brain wounds:

	Cases	Percentage
Partial or generalized epileptic seizures.....	676	10.14
Late cerebral abscess.....	91	1.41
Late meningitis.....	32	0.48
Late cerebral hernia.....	54	0.81
Mortality.....	83	1.24
Sudden deaths.....	1	

TUFFIER and GUILLAIN are rather of the opinion that a foreign substance in the brain if well tolerated should be left. The gravity of the prognosis of such cases appears to be exaggerated. Regarding cranioplasty they think in small trepanations it is easy, but of relatively little use; in larger losses of bone substance, on the contrary, it would be very useful, but is then difficult if not impossible, and not without chances of great danger. The operative indications of cranial plastics appear to the authors relatively limited and chiefly for æsthetic reasons.

The general study of secondary and late complications of cranial and cerebral wounds has shown that such complications are less frequent than was supposed, and that the prognosis is brighter than has been stated. This improvement in prognosis undoubtedly depends on early treatment, the technique of which is now more rational and better directed than in the beginning of the war.

The following conclusions were adopted:

1. If secondary complications of cerebral wounds are relatively frequent, later infectious complications are much rarer than supposed.

2. The consecutive organic troubles in brain wounds, i.e., hemiplegia, monoplegia, aphasia, visceral troubles, etc., frequently have a tendency to disappear. Their treatment comes under the domain of neurology.

3. The later epileptic seizures of jacksonian character can be benefited by the removal of the compressive cause, foreign bodies, bone fragments, etc. It is not of much use to operate for one or two isolated attacks of jacksonian epilepsy, for they may be due to encephalitis, capable of resolution, and on which operation would have no influence. Epileptic seizures, outside of cases where a foreign body or a bone fragment exists, do not call for any new surgical operation. Lumbar punctures, in case of hypertension of the cerebrospinal fluid, controlled by a manometer may have a good result.

4. Late cerebral abscesses diagnosed and differentiated from non-suppurative encephalitis ought to be operated upon after accurate clinical localization made by the surgeon and the neurologist. After exploratory puncture and without destroying the protective adhesions, the abscess should be opened and its sterilization followed bacteriologically.

5. Late localized meningitis and encysted abscesses of the meninges must be operated upon.

6. Treatment of generalized meningitis is most frequently ineffective. Repeated lumbar



punctures appear to be the most rational form of treatment.

7. Cerebral herniæ with an abscess are to be operated upon and the abscess drained. It seems preferable to abstain from lumbar puncture at the first acute feverish stage of certain cerebral herniæ in view of avoiding possible diffusion of a localized infection. When the initial infection has subsided, lumbar puncture by diminishing the intracranial pressure may favor the reduction of these herniæ. The resection of herniæ is an operation only justified in a case of local necrosis or of meningocele.

8. Intracerebral foreign bodies causing attacks of encephalitis or epileptic seizures should be extracted. Foreign bodies that cause no trouble should be left alone.

9. Cranioplasty is indicated from the æsthetic point of view, especially in losses of substance of the frontal region. From the therapeutic point of view it is only justified in cases where the extension of the scar is the cause of complications observed. From the prophylactic viewpoint the danger of an ulterior cranial accident in the trepanned region may be an operative indication. In any case there should be assurance that there are no contra-indications to intervention on the score of nervous trouble, chemical or cytologic modification in the cerebrospinal fluid, or papillary stasis.

10. Early treatment and methodical disinfection, with primary sterilization of the intracerebral traumatized area is the best prophylactic treatment of secondary or late infective complications of head wounds.

OPERATIONS ON THE PERIPHERAL NERVES AND THEIR END-RESULTS

DEPAGE reported the researches and cases observed in the Belgian ambulance "Ocean" at LaPanne. These comprised 46 cases of complete transverse section and 22 cases of partial lesion, compression, adhesion, lateral neuroma, etc. Complete interruptions of the nerve were treated by resection and suture. De Page says that in 95 per cent of such cases there is certainty of the growth and of the penetration of the young fibers into the peripheric end; and to effect this is the object of surgery. Expectant treatment must be discouraged; immediate or early surgery is the treatment of choice. Suture of the nerve gives good results in 80 per cent of cases. These results depend on early operation; a sufficiently large resection of the nerve extremities; exact, hermetic, superficial suture; wrapping the nerve-ends in a suitable sheath,

preferably cellulo-adipose. Grafting is recommended when a very considerable gap exists between the two ends. Autotransplants appear to be best. In partial lesions operation is successful in the majority of cases. This is either a decompression, destruction of adhesion, or resection of a tumor.

GOSSET presents a résumé of French neurological surgery since the beginning of the war, and its end-results. His statistics comprise 1,340 operations on nerves reported as carried out in various neurological centers, the cases of individual surgeons as reported in the literature, and 671 operations on peripheral nerves carried out in his own personal service.

The results, which are discussed in detail for each nerve, are summed up in the following tables:

Table 1. Comparison of the results of 1,340 nerve operations according to figures furnished by various neurological centers and without specifying the nature of the operation:

	Percentage Improved
Brachial plexus.....	50
Median.....	23
Radial.....	25
Ulnar.....	38
Sciatic.....	40
External popliteal.....	45
Internal popliteal.....	42

These figures obtained from very different sources have only a relative value. For instance, in the case of the radial nerve only 25 per cent of success is shown, whereas the statistics of individual surgeons give 50 to 80 per cent of good results for this nerve.

Table 2. Six hundred and seventy-one personal cases of nerve lesions operated in Gosset's service:

	No Results Per cent	Improvement Per cent	Considerable Improvement Per cent	Recoveries Per cent
<i>Liberation of Nerve</i>				
External popliteal...	33.3	....	44.4	22.2
Radial.....	18.2	22.8	40.8	18.2
Sciatic.....	21.1	31.5	31.5	15.8
Brachial plexus.....	14.3	21.4	50	14.3
Internal popliteal...	....	50	50	....
Median.....	10	43.3	40	6.6
Ulnar.....	28.1	28.1	31.2	12.5
<i>After Suture:</i>				
Brachial plexus.....	....	....	66.6	33.3
Radial.....	37	3.7	33.3	26
Sciatic.....	38.8	11.1	50	....
External popliteal...	22.2	27.7	50	....
Internal popliteal...	25	25	25	25
Ulnar.....	47.2	36.1	8.3	8.3
Median.....	43.7	12.5	43.7	....

The average time for return of voluntary movements after nerve resection and end-to-end suture and after nerve liberations shown in the following table:

	After resection and suture	After liberation
Median.....	6 months, 23 days	5 months, 5 days
Radial.....	8 months	3 months, 27 days
External popliteal...	10 months, 25 days	4 months, 21 days
Internal popliteal...	11 months	
Ulnar.....	11 months, 11 days	5 months, 15 days
Brachial plexus	12 months, 15 days	4 months, 15 days
Sciatic	16 months	8 months

GOSSET concludes from his study that at the present time suture is the true method of treating nerve lesions. If it has not always given the expected results, it is because the operation was done late after suppuration and when the nerve-ends were much separated and converted into fibrous tissue.

The Congress adopted the following conclusions:

1. Operations on the nerves for wounds of war have given only relatively mediocre results up to the present time. Partial lesions give a percentage of good results superior to that of total lesions.
2. These mediocre results are especially due to the late period of operation.
3. Operation should never be done when there is suppuration in the region.
4. The three principal causes of failure in late operations on nerves are: (a) sclerosis of the peripheric end which increases as time goes on; (b) too great separation of the two ends; (c) intensity and duration of the suppuration.
5. Tendinous retractions, articular ankylosis, muscular ischæmia, and sclerosis in a great measure diminish the value of functional results. It is necessary from the beginning to give to the articulations an appropriate correct position.
6. Primary suture of the nerve, made possible by the present methods of disinfection of wounds, considerably improved the results from the point of view of the frequency, rapidity, and degree of functional recovery.
7. Even in the case of an unsuccessful result, primary suture maintains the nerve extremities in such an anatomical condition that a new operation is greatly facilitated.
8. Functional recoveries are slowly effected; they demand months, perhaps years; and this must be taken into consideration in the appropriation of pensions.

#### THORACO-ABDOMINAL WOUNDS

BOWLBY finds that there is a thoraco-abdominal lesion in about 9 per cent of all thoracic wounds. He reports on 55 such. One or more of the abdominal viscera may be involved. He thinks the diaphragm opening is better approached from the pleura; and that if an abdominal operation is necessary, this is much better done after the closure of the diaphragm and pleura.

VONCKEN finds that about 20 per cent of abdominal wounds are accompanied by a concomitant thoracic wound. Thirty such cases have been treated in his service. The mortality varies from 50 to 60 per cent. Voncken thinks the transpleural approach to an injury of the diaphragm is best when the costal opening allows the lesion to be seen, and in such cases it suffices to enlarge or regularize this traumatic opening. This route is also preferable to the abdominal when the diaphragm rupture is situated on the posterior face of the dome, as it permits good access to posterior lesions of abdominal organs.

DUVAL prefers a combined thoraco-abdominal incision, practically a thoracotomy. He operated upon 5 cases in this way with a successful result in all.

The Congress adopted these conclusions:

1. In thoraco-abdominal wounds injury to the diaphragm constitutes the specific factor of the lesion. The wounds of the thoracic and abdominal organs present nothing special from the anatomical point of view.
2. It is difficult to recognize hernia of the abdominal organs clinically. Radioscopic examination by showing the displacement of the heart to the right is a diagnostic sign of which account should be taken, especially for left hæmothorax.
3. Operative indications are nearly absolute, exception being made for those cases in which a very small projectile involves only the high part of the abdomen, and especially the right. Perforation of the diaphragm of itself calls for suture, apart from any operative indications on the part of the thorax and abdomen.
4. The transpleural thoracic route is the most advantageous for inspection of the lesions, for the treatment of the pleural cavity, and for repair of the diaphragm rupture. It permits the treatment of the lesions of the subdiaphragmatic abdominal organs, herniæ or other injuries.
5. A separate laparotomy may also be indicated.
6. Thoracotomy permits ample treatment of the thoracic and abdominal lesions at the one time.

W. A. BRENNAN



# ABSTRACTS OF CURRENT LITERATURE

## GENERAL SURGERY—SURGICAL TECHNIQUE

### OPERATIVE SURGERY AND TECHNIQUE

**Barthelemy, Marlot and Jeanneney: The Advantages of Early Secondary Suture of War Wounds** (Note sur les avantages de la suture secondaire précoce des plaies de guerre). *Bull. et mém. Soc. de chir. de Par.*, 1918, xlv, 7.

The authors have practiced early secondary suture of wounds in 40 cases. When all inflammation has disappeared and all necrotic tissue removed they make an incision circumscribing the ulcerated surface in healthy skin about 5 mm. distant from the edge of the wound. The incision is deepened to the aponeurotic layer and the whole block is removed like a tumor. The operative field is then thoroughly disinfected with ether. If traction is necessary to draw the edges of the new wound together, the bistoury is used freely to strip subcutaneously until an easy approximation is obtained. Complete suture is then done, especially at the angles of the wound. The dressings are renewed after forty-eight hours. Latent infection may break out and must be watched for. Small local pus collections must be emptied and a little ether injected.

The results have been as follows: In 26 cases, primary union was very rapid, in 15 days at least; in 11 cases rapid union took place in spite of some suppuration about some of the stitches. Exceptionally this lasts one month. In 2 cases results were only fair, due to a faulty technique. One case was a failure because the excision was not sufficient.

In one of these cases, in which there was a large wound of the soft parts of the left subscapular region 18 cm. long, recovery was by first intention in eight days.

In general, complete recovery has been obtained in from fifteen days to a month. Suture can ordinarily be done within fifteen days after the man enters the hospital. The final cicatrices are supple, solid, non-adherent, and in every way quite satisfactory.

W. A. BRENNAN.

**Maddox, R. D.: The Maddox Orthopedic Frame.** *Am. J. Surg.*, 1918, xxxii, 68.

The author describes an apparatus for the application of jackets, spicas, and all other plaster dressings. The whole apparatus can be placed in a hand-case and weighs complete about forty-five pounds.

This frame will accomplish the same results as the larger stable orthopedic frames, and while of

original design, involves no new principles in the application of plaster-of-Paris dressings. It is simply a mechanical adaptation of the best principles of the ordinary apparatus, simplified so that it can be taken apart and packed in a compact case.

In addition to the above, it can be used to provide necessary parts for bed traction apparatus. It is just as adaptable to adults as to children, and when its possibilities and use are thoroughly understood, this orthopedic frame should prove to be a very valuable apparatus.

**Davis, N., and Owens, R.: Pituitrin; Its Value in Postoperative Treatment.** *N. Orl. M. & S. J.*, 1918, lxx, 712.

The fear of postoperative nausea, vomiting, and gas pains deters many from submitting to abdominal operation. The gas pain problem has been solved by the use of pituitrin hypodermically.

The method used is as follows: the administration of morphine, gr.  $\frac{1}{6}$ , and atropine, gr.  $\frac{1}{180}$ , hypodermically one hour before operation. Immediately after operation the administration of one ccm. of pituitrin hypodermically. This same dose is repeated in two hours; two hours later,  $\frac{1}{2}$  ccm. and four hours later another  $\frac{1}{2}$  ccm. Where too much handling of the viscera has not occurred, no more pituitrin is given; but in severe operations, doses of  $\frac{1}{2}$  ccm. are continued every four hours until twenty-four hours following operation. Twenty-four hours after operation 3 gr. of calomel in  $\frac{1}{2}$  gr. doses are given every half hour, followed by a saline cathartic.

A series of 126 cases are reviewed, of which 104 were non-septic and 22 septic. In addition they encountered 9 cases of eclampsia in which treatment as outlined was given, but over a longer period of time. In these cases it was noted that the urine output commenced earlier and was less scanty.

From their series of cases, the conclusions are drawn: (1) Pituitrin is a valuable drug in stimulating the muscular coat of the intestine after abdominal section in non-septic cases. (2) It is of decided aid in preventing postoperative shock in non-septic cases of abdominal section, as evidenced by lack of rise of temperature or pulse-rate. (3) It does not appear to have any influence in cases complicated with septic peritonitis. (4) It stimulates the secretory activity of the kidneys in eclampsia. (5) It materially reduces the postoperative suffering.

I. E. BISHKOW.

## ASEPTIC AND ANTISEPTIC SURGERY

**Sweet, J. E., and Hodge, E. B.: Further Experiences with Dakin's Dichloramin-T in the Treatment of War Wounds.** *J. Am. M. Ass.*, 1918, lxx, 605.

The authors present the results of more extended experiences with this antiseptic, limiting this report to their own service, although the same method has been used in a greater number of severe cases treated and classified in a general way; only the surgical failures are here discussed. In no sense whatever was the material chosen. The patients remained at the hospital only until they were in fit condition for evacuation.

Of the cases, thirty were amputation stumps, not including amputations distal to wrist or ankle; 94 were compound fractures of the upper extremity, of which 40 involved the humerus; 78 were compound fractures of the lower extremity, of which 27 involved the femur; 31 were severe buttock wounds; 131 were severe wounds of the lower extremity, without fracture; 34 were severe flesh wounds of the back; 82 were severe miscellaneous wounds, of the head, face, neck, etc.

Two patients died of anaerobic septicæmia, two from infected foreign bodies in the brain, one from septic peritonitis six hours after admission, one from bronchopneumonia twenty-four hours after admission, three of traumatic meningitis, one of septicæmia, one of pyæmia, one of œdema of the lungs. Two amputations have been performed; in both instances the patients were admitted with symptoms of simple gangrene due to the destruction of the vessels of the leg by shrapnel. They have had one case of long-continued sepsis due to a wound of the knee-joint. Secondary hæmorrhages have occurred in five cases.

Bacteriologic studies of wounds have been made. Secondary closures have been practiced in a few cases. The length of time required for the sterilization of a wound depends, the authors believe, upon the extent of the infection and the character of the microorganisms present.

E. C. ROBITSHEK.

**Pearson, W.: Clinical Observations on the Effects of Flavine in Wound Treatment.** *Lancet*, Lond., 1918, cxciv, 370.

This paper is an official report on the effects of flavine used in a series of cases at a war hospital. Flavine had previously been used in this same hospital by Prideaux and abandoned because of the unfavorable results. The clinical observations of these two men are in agreement. This report is of value because of the negative findings and the adverse criticism offered.

A 1:1,000 solution of acriflavine in sterilized normal saline was used in all cases. It was employed as a lotion for irrigating the wounds at each change of the dressings and also in gauze packs placed in the wounds and outer dressings. Dressings and packs were changed from one to three times in twenty-four hours.

Numerous cases were used as controls during these observations and in some instances it was possible to treat one or two wounds with flavine and other similar wounds on the same patient with normal saline or boric solution.

No cases were received early enough to try the prophylactic value of flavine; but two groups of patients were selected; first, those in whose wounds sepsis was active; and second, those in which sepsis had been controlled and repair had already begun. In the first group of cases it was concluded that flavine has no influence on local reactions nor on the character of the discharge following operation, and the rate at which granulations first made their appearance was not affected by flavine; but the granulations which did form were pale and gelatinous in appearance.

In the second group of cases it was noted that necrotic shreds, sloughs, etc., appeared tough and leathery and their separation from healthy tissue was so obviously delayed that treatment with normal saline or boric solution was substituted with immediate good results.

In several wounds where healthy, bright pink granulations had formed and were almost ready for secondary suture or skin grafting, the effect was injurious and in three to five days had changed for the worse.

In concluding the article, the author states that he has entirely abandoned the use of flavine in his work.

P. W. SWEET.

**Blair, A.: Two Years' Experience of Septic Wounds in a V. A. D. Hospital.** *Brit. M. J.*, 1918, i, 169.

The great majority of wounds seen in a V. A. D. hospital are septic and have been treated at the military hospital with indifferent success. Many of the wounds are very foul and many have been operated upon for the removal of bullets, fragments of shell and necrosed bone. The most intractable cases have been wounds of the lower limb with infection of bone or wounds in or about the knee-joint.

Conservative treatment is the aim at the hospital with as little operative interference as possible. The patients are given a generous diet and kept in the open air as much as possible. Wherever a foreign body is present, it is removed and drainage established as soon as possible, and at times it has been necessary to re-open a wound or to re-amputate. Exposure of the wounds to direct sunlight has in almost all cases been followed by good results. Where there is stiffness or contraction, massage is a means of speeding up the healing process.

Many of the various antiseptics have been used with little difference in the results. Where there was a great sloughing of the parts, the damaged tissue that could be reached without much cutting was removed, a stream of warm hydrogen peroxide introduced into every part of the wound and drainage established. Where suppuration was profuse and there was swelling and redness of the parts, hot boric fomentations frequently gave good results.



Compound fractures, extensive frost-bite, and bad cases of trench foot did well when treated with the continuous antiseptic bath. Foul sinuses of long standing were treated with pure carbolic acid, then irrigated with hydrogen peroxide in a gentle stream, lightly covered with gauze and exposed to sunlight. Eusol, Dakin's solution, and "bipp" paste are all useful. However, the author's experience points to the superlative importance of sufficient drainage, while the antiseptic employed is of secondary importance.

The importance of rest is great; placing the injured part in a position of immobility was found the best method of treatment. Elastic pressure as recommended by Liek has given good results in wounds which remain open with weak, flabby granulations, especially where there has been extensive loss of tissue in the neighborhood of the femur or tibia. V. C. HUNT.

**Huguet, Barré, Simonin, and Fayol: Primary Suture of Wounds** (Sutures primitives des plaies).

*Bull. et mém. Soc. de chir. de Par.*, 1918, xlv, 362.

The authors report on 173 wounds treated by primary surgical cleansing and immediate suture under active fighting conditions necessitating rapid disposal of the wounded.

Of 52 wounds of the soft parts, there were 49 recoveries and 3 failures; of 21 fractures of various types, 17 recoveries, 4 failures; of 40 articular wounds, 35 recoveries, 4 failures; of 63 cranial wounds of all types, 63 recoveries.

In soft part wounds and bone lesions they remove the track of the projectile *en masse*, remove the projectile and bone chips, wash the healthy tissue left with ether, and suture, leaving a mesh drain for two days. In joint injuries the articulation is washed with ether and early mobilization established. In head cases even when there is a complete fracture and opening of the dura mater, they remove spicula, regularize the orifice, and after ether lavage make a firm reunion. W. A. BRENNAN.

**Munroe, A. R., McGill, M. D., Fleming, A. G., and Janes, R. M.: Wound Flora in Relation to Secondary Suture.** *Brit. M. J.*, 1918, i, 173.

The flora of all septic wounds consists of a conglomerate variety of bacteria: staphylococcus, streptococcus, pyocyanus, the welchii group, and bacilli with end or central spores. On analyzing fifty cases of secondary suture it has been noted that in all failures the anaerobic culture showed there had previously been a very active infection. The cultures in some instances showed an active streptococcus and in others a spore-forming bacillus. In either instance even with a low bacterial count the wound broke down after secondary suture; where these were absent the wound remained closed after secondary suture.

Where the anaerobic culture shows a virulent infection, and where the culture shows spore-forming

bacilli it would be advisable not to attempt secondary suture until the wound is absolutely sterile.

The bacterial count, while not an absolute guide, is of very considerable help, but most important is the particular bacteria present in a particular wound. Along with the streptococcus, the bacillus welchii is found almost constantly, the streptococcus being the most persistent. V. C. HUNT.

## ANÆSTHETICS

**Pol Coryllos: High and Low Spinal Anæsthesia with Novocaine as a Method of General Anæsthesia** (L'anesthésie rachidienne, haute et basse, à la novocaïne, comme procédé d'anesthésie générale). *Bull. et mém. Soc. de chir. de Par.*, 1918, xlv, 367.

During a part of 1917 the author who was attached to the French Medical Mission in Roumania worked with Jonnesco and hence had ample opportunity of studying the effects of his method of spinal anæsthesia. Coryllos is not enthusiastic about it. If low spinal anæsthesia, lumbar or dorso-lumbar, gives excellent results, cervical or high dorsal anæsthesia causes respiratory complications, cyanosis, and there was 1 death in a series of 20 cases of mediocervical or dorsosuperior following injection of 25 mg. of stovaine mixed with 1 mg. of strychnine.

Coryllos has therefore replaced stovaine-strychnine by novocaine with the most fortunate results. He has used it in a series of 219 cases and is enthusiastic over its simplicity, innocuity, and the anæsthesia obtained.

The difference in the results lies in the substitution of novocaine alone, as Coryllos has never observed any harmful effects from high puncture of the cord anywhere between the fourth cervical and first lumbar vertebræ.

Mediocervical injection gives anæsthesia of the head and neck. Injection between the seventh cervical and first dorsal assures anæsthesia of the upper limbs, of the lower part of the neck and the upper part of the thorax. Dorsal puncture between the second and fourth dorsal vertebræ anæsthetizes the thorax and contained organs. Injection between the fourth dorsal and first lumbar obtains anæsthesia of the lower thorax and the whole abdomen. It is ideal for laparotomies. Finally, injection between the first and second lumbar vertebræ assures hypogastric, genital and lower limb anæsthesia. Sometimes a double regional puncture is necessary owing to the multiplicity of lesions. It was done in 8 cases.

The dosage is 10 cg., about 1 ccm., of a 10 per cent solution of novocaine for inferior dorsal and superior lumbar anæsthesia; 7 to 8 cg. for middle and upper dorsal; 5 to 6 cg. for mediocervical anæsthesia. When a double injection is made the dose ought not exceed 7 cg.

Coryllos used this anæsthetic in the following 219 operations: on the head and neck, 30; on the upper

limbs, 31; on the thorax, 19; on the abdomen, 22; on the femur, 8; on the lower limbs, 108. There was no accident or any other complication.

The article gave rise to a very animated discussion and the principal points brought out were: Chloroform and ether are dangerous in many ways and it is desirable that some newer anæsthetic agent should be employed; spinal anæsthesia is useful in war surgery; although the experience of many who had tried the Jonnesco method is mainly unfavorable, yet they are willing to admit that the faulty results were due to personal technique rather than to the method; finally, the facts regarding spinal anæsthesia, especially high injections, are not yet numerous enough to enable definite opinions to be expressed.

W. A. BRENNAN.

**Sollmann, T.: The Comparative Activity of Local Anæsthetics: Paralysis of Sensory Nerve Fibers; Anæsthesia of Frog-Skin; Anæsthesia of the Human Skin; General Conclusions.**  
*J. Pharmacol. & Exp. Therap.*, 1918, xi, 1, 9, 69.

The efficiency of local anæsthetics on the sensory fibers of nerve-trunks the author considers of greater practical importance than their efficiency on the motor fibers. However, it can be measured in animals only by the transmission of reflexes, which introduced complicating factors.

This principle was first used on mammals by Potetzky in 1903, under Biberfeld. He exposed the sciatic or brachial nerve of rabbits or dogs for some distance, sprinkled it with the anæsthetic in substance, and repeated the stimulation in five-minute intervals, noting the time of paralysis. The method was not quantitative since the concentration of the anæsthetic was unknown.

The method was again tried by Fromherz in 1914. However, he employed solutions and instead of determining the time of paralysis, which was variable, he determined the concentration required for complete anæsthesia. His animals had received morphine, 10 to 15 mgm. per kilogram of body weight. He applied the method to phenyl urethane derivatives, which have no interest in this connection.

He also made some experiments with novocaine and cocaine and concluded that much lower concentrations were effective than those required when these anæsthetics were applied to the frog's foot or to the cornea. No investigation appears to have been published in which the method had been applied systematically to frogs, as in the present work.

The frogs were decapitated, leaving the lower jaw. A transverse section was made through the abdomen just below the sternum, comprising about two-thirds of the circumference. The viscera were removed through this opening. The frogs were suspended by the lower jaw, and the eviscerated body cavity, which formed a little pocket, was filled with pledgets of cotton saturated with the anæsthetic solution, and then a further quantity of the solution was poured in to insure thorough saturation. In a

series of six tables the author gives in detail the results of his experiments, and draws the following conclusions:

The activity on sensory nerve fibers was studied by applying the anæsthetics to the sciatic plexus and observing the presence or absence of reflex response to stimulation of the foot.

Cocaine, novocaine and tropacocaine hydrochlorides were about equally efficient. The efficiency of potassium, alypin, quinine urea, and especially antipyrine, was smaller; and their efficiency ratio in comparison with cocaine was lower than for motor fibers.

Alkalization increased the efficiency of the organic anæsthetic from two to eight times, the increase being generally about one-half as much as for motor fibers.

Epinephrin did not increase the efficiency, this result being the same as with the motor fibers.

Mixtures of cocaine with novocaine hydrochloride or with quinine urea hydrochloride gave simple summation without potentiation, just as with the motor fibers.

Mixtures of the anæsthetics with potassium did not show potentiation, differing in this respect from motor fibers. Apparently, therefore, the sensory fibers showed some important differences from motor fibers in their response to local anæsthetics.

In investigating the anæsthesia of frog-skin, the application of the anæsthetic solution involved penetration, as well as the action on the finer sensory nerves. In view of the physiological similarity of the frog-skin to mucous membranes, the method approached clinical surface anæsthesia. It was simplified, however, since the removal of the drug by absorption was minimized through destruction of the circulation.

In practicing this method the anæsthetic was usually applied to the skin of the frog's foot; the existence of anæsthesia was ascertained by observing the presence or absence of reflex response to sensory stimulation of the foot. The frogs were decapitated, leaving the lower jaw. The heart was excised. The frogs were suspended from the jaw. Each leg was immersed in a homœopathic vial containing 6 to 8 ccm. of the anæsthetic solution, reaching about midway to the knees. A cuff of adhesive plaster about both thighs prevented the frog from removing its legs from the solution.

At the end of every ten minutes the legs were withdrawn and the foot immersed in  $\frac{U}{10}$  HCl. If

the animal reacted by sharply jerking the foot from the acid, the leg was washed in water and replaced in the solution, this procedure being repeated every ten minutes during an hour or until the paralysis was completed. Intactness of the reflex centers was confirmed by applying the acid to the leg above the level of the immersion.

The author has compiled a series of tables showing the results of his investigations. He makes the following conclusions:



The application of the anæsthetics to the skin of the frog's foot approached the conditions of surface anæsthesia, involving penetration of the drug as well as action on the sensory fibers, but was somewhat simplified by doing away with the absorptive removal of the drug. The results differed in some important respects from those of direct immersion.

The efficiency ratios for the frog-skin were different for prompt and for slow anæsthesia. Cocaine, alypin and tropacocaine made the best showing. Novocaine was relatively less efficient than for conduction anæsthesia; potassium, quinine urea and antipyrine made a very poor showing for fast anæsthesia; much better for slow anæsthesia.

Alkali increased the efficiency even more than for immersion.

Epinephrin did not increase the efficiency.

Mixtures of cocaine with novocaine or quinine did not potentiate; nor did mixtures of potassium with cocaine or novocaine.

In investigating anæsthesia of the human skin, the local anæsthesia of the wheals produced by the intracutaneous injection of the anæsthetics involves the finest nerve fibrils, and possibly the sensory endings, and therefore minimizes the complicating factor of penetration, which renders it very suitable for the comparison of the absolute anæsthetic power. However, the drugs disappear fairly rapidly by systemic absorption, but this may be avoided, either by confining the observations to short intervals, or by combining the drugs with epinephrin.

The end-point, the absence of sensation, is somewhat subjective and not very delicate; but its accuracy is about that of the other methods and sufficient for practical purposes. The method is therefore the best for comparing absolute anæsthetic efficiency. It has the added advantage that its results can be transferred directly to a clinical use, namely, superficial infiltration anæsthesia; and it approaches quite closely the conditions of intra-neural and conduction anæsthesia. It cannot be applied to surface anæsthesia. Because of these advantages, Sollman states, the wheal or Quaddel

test is being used quite extensively since its introduction by certain investigators.

The author has made up a series of tables in this article giving the results in more or less detail, and from his investigations he makes the following conclusions:

The wheal method on the human subject gave probably the nearest approach to the absolute anæsthetic power. Its results were applied directly to injection anæsthesia, but not to surface anæsthesia. For the latter, the corneal test was the most suitable.

The suitability of the different anæsthetics for these two types of anæsthesia is shown in one of the tables. For injection anæsthesia, cocaine, novocaine, tropacocaine and alypin were about equally efficient; beta-eucaine was one-half and quinine-urea was one-fourth as active; apothecin, antipyrine and potassium chloride being one-eighth as active.

There were fairly large differences in the duration of action; but these differences were insignificant when compared with the differences that were produced by the addition of epinephrin.

The addition of sodium bicarbonate to cocaine or novocaine did not increase the activity. It was therefore not useful, in contrast to surface or intra-neural anæsthesia.

The addition of epinephrin prolonged the action very greatly, except with tropacocaine. The epinephrin did not, however, change the minimal efficient concentration.

Mixtures of cocaine, novocaine and quinine-urea hydrochlorides gave somewhat deficient summation without potentiation. There was, therefore, no advantage in such mixtures.

Mixtures of the anæsthetics with potassium sulphate gave only simple summation. There was some advantage in reducing the required amount of the anæsthetic, the conditions being more favorable than with mucous membranes, which gave not even summation; but too much should not be expected from the potassium mixtures.

GEORGE E. BEILBY.

## SURGERY OF THE HEAD AND NECK

### HEAD

**Armitage, H. M.: Blood-Pressure in Head Injuries.**  
*N. Y. M. J.*, 1918, cvii, 250.

In the past few years several symptoms have been added as an aid in the diagnosis of borderline cases of compression, concussion and contusion: a high systolic blood-pressure during the third stage of cerebral compression, the findings of the ophthalmoscope, and increased pressure of the cerebrospinal fluid at lumbar puncture as registered by the spinal mercurial manometer.

The ophthalmoscope is of value after the first six hours. The diagnosis of increased intracranial pres-

sure before medullary involvement has taken place by increased pressure as ascertained by the spinal mercurial manometer has been found fallacious by many investigators. In fractures of the base it has been the author's experience that blood-pressure readings are of no diagnostic value. This is due to the fact that in widespread hæmmorrhages, bulbar symptoms may not occur until late.

Kocher's description of the various stages of compression show that the symptoms are the result of circulatory disturbances, i.e., a primary venous stasis, resulting in capillary anæmia. It shows also that anæmia of the medulla elicits the so-called bulbar symptoms of decompression.



The systolic pressure in traumatic compression is in the large majority of cases increased, but not enough in the early stages to be of diagnostic value. The pulse-pressure is of importance, however, as is also the diastolic pressure. A high pulse-pressure is present early in cases of compression, and as the compression continues, the pulse becomes higher and the pulse-rate lower. The relation of the pulse-pressure to the pulse-rate and to the diastolic and systolic pressures must be studied and will prove a valuable aid in diagnosis, taken together with the entire group of symptoms.

I. E. BISHKOW.

**Sobotky, I.: Severance of the Chorda Tympani Nerve.** *Boston M. & S. J.*, 1918, clxxviii, 224.

The author reports a case in which a paracentesis was done for a right acute otitis media, following which the patient experienced a numbness of the right side of the tongue and a loss of taste sensation on that side. Examination of the left ear showed the chorda tympani nerve to be located lower than usual and the assumption was made that the corresponding right nerve was severed. Tests with solutions showed no taste in the anterior half to two-thirds of the tongue on the right, except possibly at the very tip. Taste was present on the right posterior third.

H. H. FREILICH.

**Ortali, O.: A Plastic Method in Wounds of the Superior Longitudinal Sinus** (Processo di plastica in ferite del seno longitudinale superiore). *Gazz. d. osp. e d. clin.*, Milano, 1917, xxxviii, 1293.

Ortali reviews the current methods of dealing with hæmorrhage from the sinuses in the case of cranial wounds. In extensive wounds of the superior walls of the longitudinal sinus, and especially in the posterior zone where there is confluence of the various sinuses, he finds that hæmostasis by the ordinary methods of tamponade, ligation, etc., is insufficient, as well as difficult to execute.

While in general the use of aponeurotic muscle strips as counseled by Horsley and others appears favorable, the author prefers to use epicranial aponeurosis in this particular class of injuries. The strip is cut in the vicinity of the lesion, the periosteum being preserved. It is pediculated and sufficiently large to cover the sinus lesion and is fixed by a few catgut or silk sutures. A successful case is described. The author claims rapid and safe hæmostasis, with preservation of the permeability of the vessel.

W. A. BRENNAN.

**Vanderbossche, A.: Gunshot Cranial and Cerebral Wounds** (Plaies du crâne et du cerveau par projectiles de guerre). *Bull. et mém. Soc. de chir. de Par.*, 1918, xlv, 131.

Vanderbossche has operated in 92 cases of cranial and cerebral injuries since the beginning of the war, mostly in Serbia and Macedonia, where, because transportation facilities were poor, the cases were mostly late in arriving and advanced in infection. He has had a mortality of 39 per cent; but

meningo-encephalitis, abscess, or cerebral hernia were in full development in the majority of those cases when received for treatment.

Vanderbossche's views regarding the evolution and early operative treatment of cerebral and cranial injuries generally coincide with those expounded by other war surgeons. These late treated infected cases after operation are left open, loosely tamponed with gauze soaked in oxygenated water, the angles of the incision being sutured. Drainage is indispensable in the case of cerebral abscesses. The rubber drain seems to suit best, but it is difficult to fix it properly so that it will neither become enmeshed in the cerebral tissue nor expelled. It may be necessary to place the patient in ventral or lateral decubitus, according to the situation of the wound, in order to drain properly.

The author does not think that cerebral hernia is the result of strangulation of a portion of the inflamed cerebral tissue by the meningocranial ring. Autopsies have shown him that the hernia is only the exterior evidence of a deep septic brain process. It is a mechanical phenomenon of deep pressure. He therefore thinks that liberation, even section of the hernia, with the object of draining the sub-jacent septic area is the proper treatment of rebellious progressive cases.

The author gives short histories of 24 cases which he has been able to trace, some of which were treated in 1914.

W. A. BRENNAN.

**Schwartz, A., and Mocquot, P.: Cranial Wounds in Ambulance Service at the Front** (Les plaies de crâne dans les ambulances l'Avant). *Rev. de chir.*, Par., 1917, liii, 50.

The authors review a large number of cranial wounds treated in their surgical ambulance service. Trepanations are done as far as possible under local anæsthesia, as it has the advantage of avoiding operative shock. The extent of operation or its depth offers no obstacles. General anæsthesia is confined to the semicomatose or those highly excited or with some other marked contra-indication.

The authors prefer an H-incision. A semicircular incision is confined to wounds in the temporal region, to small punctiform wounds, or to such lesions as do not call for extensive drainage. The H-incision is made with the transverse branch long, corresponding to the major axis of the wound. The perpendicular branches can be lengthened later if necessary. The incision gives better light and can always be enlarged; it permits easy approximation later with a good cicatrix. The operation then depends on what is found, whether a fracture, an intact or open dura, etc.

Although it is the author's general practice to respect an intact dura, yet there are some rare conditions which indicate its surgical opening. These are shown either by the clinical symptoms or the local aspect. The clinical symptoms are signs of cerebral compression, coma with stertor, slow pulse, dilatation of pupils, etc. The local aspect is



either the bluish tint of the dura suggesting the existence of a blood-clot, or the absence of fluctuation. Opening of the dura is only justifiable if the wound is aseptic.

When the dura is found open and meningeal vessels bleeding, careful hæmostasis is necessary, but may be very difficult. The authors have found it best to ligate in the regions of the superior longitudinal and sphenoparietal sinuses. Other methods have not given them good results.

With regard to the removal of intracerebral projectiles, those of small volume or those situated in the hemisphere corresponding to the entry orifice should be removed under control of the X-ray.

The authors give a statistical table of their results from July, 1915, to April, 1916. W. A. BRENNAN.

**Murand, I.: Statistics of Cranial Wounds with Results After One Year** (Statistique de plaies du crâne avec résultats après un an). *Lyon chirurg.*, 1917, xiv, 810.

The author gives the end-results of 40 trepanations for cranial wounds. There were 21 recoveries and 19 deaths in from twelve to sixteen months after recovery. Of the 19 deaths, 10 occurred during the first twenty days after intervention; 6 during the second month, and 3 within six months. Mortality is highest during the first month, and if there is survival for three months, the ultimate prognosis as regards life is good.

Of the 21 surviving cases, 1 has suppurative frontal sinusitis. Nine of these cases had the dura injured with issue of brain matter in 6 cases. The author thinks that the gravity of the prognosis is less a factor of dural injury than of the presence of intracerebral projectiles. Of those recovered, 10 show some persistence of headache, tingling, etc. The author thinks that such troubles might easily improve if a proper plastic operation on the cicatrix were done. Motor and sensory troubles disappear soon after operation; but those due to cerebral lesions, paralysis and paresis, take more time.

W. A. BRENNAN.

**Le Fur, R.: Operative Technique and Results of Osseous Cranioplasty** (Technique opératoire et résultats de la cranioplastie osseuse). *Presse méd.*, Par., 1918, xxvi, 153.

Le Fur describes a new method of repairing extensive losses in cranial bone by "dedoubling" the cranial wall in the immediate vicinity and turning it over so as to cover the breach. The edge of the breach serves as a hinge.

An H-incision is made over the defect and all the cutaneous cicatricial tissue removed without opening the meninges. The fibrous tissue covering the meninges or brain is delicately removed; if any hernia exists it is reduced. The bone graft is then cut by incising into the thickness of the cranial wall adjoining the defect to be covered, until a piece a little larger than this defect is mapped out. The bone is then "dedoubled" or slit in two, working

through it with a Macewen chisel from the edge of the incision toward the edge of the breach but leaving a thin border along the edge of the breach. When the graft is freed it is held only by this thin edge. It is then reversed and turned down over the breach so that the periosteum is beneath. The free edge is then sutured with fine catgut to the periosteum around the edge of the breach which is first liberated all around except at the hinged edge, so that the graft edge can be slipped under it.

Le Fur has proceeded in this way in 37 cases, 6 of them with a breach over 7 cm. in diameter, and others with large herniæ. There has been 1 death, due to infection three weeks after operation. In this case the hole was more than 10 cm. long.

The local results are ordinarily very satisfactory. The general and functional results are not always so perfect. Generally the functional troubles which exist before cranioplasty persist after it. In no case has Le Fur observed any aggravation of these, and in many cases there was some improvement.

This method of cranioplasty is a certain means to avoid cerebral compression and Le Fur thinks that on this score it has a distinct place in cranial surgery.

W. A. BRENNAN.

**Moutier, F.: Hypertension and Death from Acute Pulmonary Oedema in Patients with Cranio-encephalic Wounds** (Hypertension et mort par œdème pulmonaire aigu chez les blessés craniocéphaliques). *Presse méd.*, Par., 1918, xxvi, 108.

Moutier has observed that in a number of cases of patients with cranio-encephalic wounds, death occurred not from the local effects of the cerebral trauma, not from any posthæmorrhagic anæmia, but from a superacute pulmonary oedema. The clinical picture is very dramatic. In investigating the matter, Moutier finds the key in a recent memoir of Rogers on the functions of the suprarenal capsules. In this it was shown that experimental cerebral embolism provokes marked and lasting arterial hypertension. Animals in whose veins relatively high doses of adrenalin have been injected die from acute pulmonary oedema. It creates such a tracheo-pulmonary hypersecretion that the fluid issues in waves through the mouth and nostrils. Death occurs by rapid asphyxia.

Moutier describes three of the cases which he observed with cranio-encephalic bullet wounds, all of which died within twenty hours of acute pulmonary oedema.

The author therefore concludes that in certain cranio-encephalic wounds the immediate menace is from the lung and not from the brain. Death may result within twenty-four hours from pathologic hyperactivity of the suprarenal capsules. This hyperepinephria brings on an increasing hypertension, and the very marked increase in pressure denotes a specific vasoconstriction.

Moutier draws attention to therapeutic errors which ought not to occur at the present time. He alludes to the use of injections of strong doses, 1



milligram for example, of adrenalin and especially the employment of adrenalized serum, which are in general vogue. It is an extremely dangerous practice. The use of adrenalin should be reserved or even not employed in the case of cranio-encephalic wounds, when it is particularly dangerous.

W. A. BRENNAN.

**McLean, S. H.: A Piece of Steel in the Brain Eighteen Years.** *South. M. J.*, 1918, xi, 245.

The patient, a school teacher, gave the following history:

When five years of age she was preparing to attend an entertainment in the neighborhood, and on getting into the vehicle she switched the horse's tail and in return received a kick in the head, causing a depressed fracture. They sent for a physician twelve miles away, and he arrived about midnight; he took the child into the kitchen and with all the coal-oil lights available began to attempt to raise the skull. The mother remarked to the doctor, "You have broken off your knife," to which he replied, "Yes, but it must have fallen on the floor." It was never found.

After a rather stormy recovery of about six weeks, the child was able to be about and gradually regained her normal health, but with a considerable depression in the skull at the edge of the hair. This gave no trouble until she was twenty-three years old, when she began to have headaches and a little tenderness over the depressed area, and slight twitching in the foot and leg which rapidly grew worse in the next few months.

The author operated the following day over the center of the depression, removing with a trepan a button a little less than the size of a half dollar, turning the flap of skin and fascia from above downward so as to place the scar of the incision in the hair. On removing the bone, instead of a knife blade, there was found a blade of a large pair of forceps, two and a half inches in length, lying between the dura and skull. It may have been polished at the time of entrance, but now it was like a piece of steel with no polish.

She left the hospital on the eighth day free from any twitching or pain. This was in October, 1915. The author saw her a short time ago, a little over two years since operation, and found her in perfect health and carrying on her vocation as usual.

E. C. ROBITSHEK.

**Rayner, H. H., and Barclay, A. E.: Note on the Extraction of a Foreign Body from the Brain.** *Brit. M. J.*, 1918, i, 226.

The damage done to the brain structures in the removal of a foreign body, coupled with the fact that fragments lodged in the brain may give rise to very little disability, argues for leaving deep-seated ones in position until such a time as it becomes evident that their presence is the cause of symptoms, and that removal, if possible, will lead to improvement.

The author reports a case, a man wounded February 7, 1917. The signs and symptoms suggested a subcortical lesion in the right Rolandic area, and the X-ray confirmed this by showing a foreign body in the suspected region. The patient was kept under observation for three months; he gradually became worse and was operated upon June 26, 1917. Removal of the foreign body was accomplished in the X-ray room by application of an extractor over the shadow of the foreign body. Recovery of the patient was quite slow but seemingly satisfactory.

The extractor is made like a pair of dental forceps, the jaws being about one and one-half inches apart when closed. Above the jaws is fitted a small fluorescent screen. Beaks or blades are fixed at right angles to the jaws and meet at the points, but are insulated from one another by a small fiber block let into one of the blades which is made slightly longer than the other. For brain work the blades are thin and close together, the point of the longer being rounded. The blades are connected with an electric bell through a relay that is specially fitted in order to avoid stimulation of structures when contact is made. When the blades are brought into correct relationship with the foreign body, contact is made and the bell rings. This indicates that by raising very slightly and opening the blades the foreign body can be picked up without any intervening structures being caught.

Protection is afforded by a sheet of heavy X-ray proof rubber placed either above or below the patient.

Only certain cases are suitable, that is, those in which access can be had to the foreign body directly in the line of the rays, and through soft structures, or with the assistance of a trephine. Old standing cases, surrounded by a fibrous capsule, are not suitable for extraction.

V. C. HUNT.

## NECK

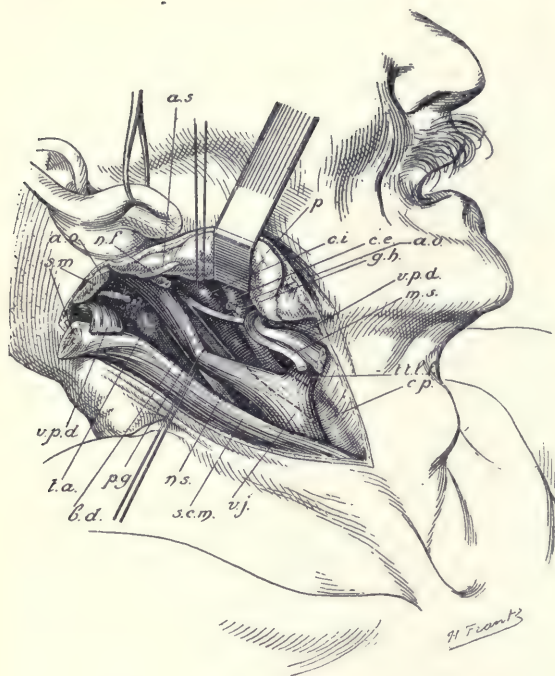
**Costantini and Vigot: Treatment of Vascular Neck Wounds, Including the Branch Vessels** (Traitement des blessures des gros vaisseaux du cou et de leurs branches). *Presse méd.*, Par., 1918, xxvi, 51.

The two clinical signs of a vascular neck injury are hæmatoma and hæmorrhage through the wound. Hæmatoma is always visible, but hæmorrhage may cease early and spontaneously. The object of surgery here is to find the injured vessel and ligate it. This can be done without causing unnecessary hæmorrhage if one has sufficient anatomical knowledge of the neck region.

If the carotids are attacked, the primary carotid is constricted with a catgut band below the region of injury; if the jugular is involved, the jugular will be constricted above the site of injury. The maneuver will in either case be done after tamponade of the vascular wound with compresses.

If the wound is situated above the thyro-linguo-facial trunks, after tamponing the wound it is





P, parotid; nf, facial nerve; sm, sections of mastoid; ao, occipital artery divided and ligated; scm, sterno-cleido-mastoid; vpd, posterior belly of the digastric; as, stylo-mastoid process; ms, stylohyoid muscle pulled aside; vj, jugular vein; tlf, thyro-linguo-facial trunk; cp, primary carotid; ce, external carotid; ci, internal carotid; gh, inferior hypoglossal; bd, descending ramus; pg, vagus; ns, spinal nerve; ta, tubercle of the atlas. (Costantini and Vigot).

necessary to ligate the thyro-linguo-facial trunk and to find the lateral sinus behind the mastoid and compress it.

To discover whether all the regions traversed by the jugular and carotid could be approached and explored without irreparable damage, the authors have made experiments on cadavers and find, contrary to what is currently taught, that the jugular and carotid vessels can be followed and explored as far as the base of the skull, provided that rigorous hæmostasis is practised at a point sufficiently far removed. To realize this essential condition, an incision is made 0.5 cm. behind the anterior edge of the sterno-cleido-mastoid and following this edge. The incision ascends until under the lobule of the ear, which is pulled up by hook forceps. Below the incision reaches the superior edge of the thyroid cartilage. Another incision is made near the upper extremity of the first, branching toward the region of the lateral sinus.

The accompanying illustration and legend explains the subsequent steps which make it possible to ligate the internal jugular near the gulf and the carotid near the base of the skull so that a prophylactic

lactic hæmostasis is assured at as ideal a distance as possible. If the lesion is arterial, the ligature will be placed on the primary carotid or even the internal carotid. If the lesion is venous, Patel's operation will be done, using the mastoid incision to lay bare the lateral sinus and compress it.

The authors have performed seven operations on the cervical vessels, with six subsequent recoveries.

W. A. BRENNAN.

**Buscarlet, F.: Suppurative Thyroiditis; a Complication of Gonorrhœa** (Thyroidite suppurée; complication de la blennorrhagie). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 2286.

The author describes a very rare complication of gonorrhœa in a man of forty-six years, a case of suppurative thyroiditis accompanied by suffocation. There was an intermittent urethral discharge. During the periods in which the urethral discharge ceased there were attacks of fever with manifestations of compression in the neck and a swelling which finally reached a phlegmonous stage.

A hard painful thyroid tumor developed which on incision yielded abundant brownish oily pus. Some weeks later the patient's symptoms of cystitis and urethritis cleared up and the neck became normal. The author was unable to make an analysis of the pus.

W. A. BRENNAN.

**Gatch, W. D.: Some Observations on the Surgery of the Thyroid Gland.** *J. Indiana St. M. Ass.*, 1918, xi, 13.

The paper is a series of observations on some phases of the surgery and pathology of the thyroid gland derived from a study of the personal cases in the light of recent literature.

Under adenomata of the thyroid the author calls attention to the fact that every possible combination of colloid, cystic, and foetal characteristics may be found. In addition to causing pressure symptoms and deformity, these adenomata may be the cause of hyperthyroidism of any degree of intensity or they may be the origin of cancer. These two dangers make it plain that in most cases early removal of the adenoma is advisable. Treatment by the administration of iodine or thyroid extract is exceedingly dangerous. Two out of five such cases observed by the author died from hyperthyroidism shortly after entering the hospital.

The author has observed five cases of cancer of the thyroid, only one of which was operable. In this case there was recurrence four or five months after operation. The difficulty of distinguishing adenoma from cancer of the thyroid, even from histologic preparations, is discussed; cancer, Gatch believes, frequently if not always arises from the so-called foetal adenoma.

The author discusses his experience with clinical means of estimating the degree of hyperthyroidism. He has found the basal metabolism test of Means and Aub too complicated and too subject to variation and error to be practical. The adrenalin skin



reaction of Goetsch on the other hand has been of very considerable service. In his hands it has denoted with accuracy whether or not hyperthyroidism was present. However, it cannot be relied upon to determine the proper time to operate upon a patient with severe thyrotoxic symptoms.

It is the author's experience that it is generally safe to operate when the pulse is faster than 100, provided there is no organic weakness of the heart. The electrocardiogram has proven of great value in estimating the functional capacity of the heart. When myocardial insufficiency exists, he takes the following precautions: more or less prolonged rest in bed before operation; the employment of an expert anaesthetist; deliberate and systematic operation with free exposure of the gland and scrupulous attention to hæmostasis; the removal of at least five-sixths of the gland. Gatch believes that local anaesthesia in these cases has no advantage over a carefully given general anaesthesia with preliminary medication with morphine carried out for several hours preceding the operation.

He removes the gland first by thoroughly exposing the lobe, tying its superior vessels and mobilizing it, then cutting across the isthmus and carefully freeing the lobe from the trachea; the lobe is then grasped between the fingers behind and the thumb in front in order to control the inferior thyroid artery while the lobe is cut away so as to leave only a thin layer of thyroid tissue posteriorly to protect the recurrent nerves and parathyroid bodies. The branches of the inferior thyroid artery are clamped as they are cut within this layer of thyroid tissue. At the conclusion of the operation the wound is thoroughly irrigated with normal salt solution and very free drainage is provided.

The postoperative treatment is much the same as the pre-operative. Alarming symptoms are met by the application of an ice bag to the heart and the administration of enough morphine to secure absolute comfort.

The contra-indications to operation in hyperthyroidism are advanced pulmonary tuberculosis, œdema of the feet, and ascites or other evidence of hopeless cardiac weakness and mania. The last is always a sign of impending death. When these complications are present, no surgical procedure should be undertaken because the inevitable fatal termination simply brings surgery into disrepute and prevents patients whom it is still possible to relieve from seeking assistance. ELLIS FISCHER.

**Krumbhaar, E. B.: Electrocardiographic Observations in Toxic Goiter.** *Am. J. M. Sc.*, 1918, clv, 175.

The author studied the changes produced in the electrocardiogram by the intoxication of exophthalmic goiter and summarizes his results as follows:

1. Electrocardiographic studies have been made of 51 cases of goiter, mostly of the toxic type, in as many cases as possible both before and after surgical operation.

2. In the series of 47 patients that submitted to surgical operation 3 deaths occurred; 2 of these offered no premonitory signs in either clinical or electrocardiographic examination; in the third case the development of negative T waves might have served as an adequate warning.

3. Electrocardiograms, essentially normal as to form and rhythm, were found in 22 cases, or 43 per cent. Preponderating hypertrophy of the right ventricle or a tendency thereto was found in 11 cases, and of the left ventricle or a tendency thereto also in 11 cases. After operation, however, one-half of the right ventricular cases showed a diminished degree of preponderance, whereas all but one of the left ventricular cases showed either no change or an increased amount of preponderance.

4. Cardiac arrhythmia was found as follows: sinus arrhythmia, 4 cases; ventricular extrasystoles, 3 cases; auricular fibrillation, 3 cases; auricular flutter, 1 case; delayed conductivity, 2 cases. Two of the cases of fibrillation and the case of flutter proved constant over several years. The other case of fibrillation was of the transient kind and disappeared coincident with the improvement that followed medical treatment.

5. The T wave was found to be unusually prominent in most cases. In about half the cases it was markedly and persistently diminished after operation. This was found to be true to a lesser degree in postoperative cases with normal hearts. Other changes in the form of the ventricular complex after operation indicated an approximation to normal cardiac mechanism.

6. Blood-pressure estimation showed an increased pulse-pressure in most cases that was diminished with the improvement that followed surgical relief. Systolic pressure was also high in those cases that showed left ventricular preponderance, but never succeeded 170 mm. Hg.

His conclusions are:

1. In early cases of toxic goiter the characteristic tachycardia is not accompanied by any signs of myocardial change that are demonstrable with the string galvanometer.

2. With persisting overaction of the heart, hypertrophy of either ventricle may become manifest.

3. Progressive hypertrophy and overaction results in myocardial degeneration that may be manifested by any type of cardiac irregularity: sinus arrhythmia, premature contractions, auricular flutter, auricular fibrillation, heart-block, etc.

4. If the existing intoxication is the chief factor in the production of the arrhythmia, this may disappear with removal of the intoxication.

5. Successful treatment, whether medical or surgical, improves the cardiac condition by this means. This is shown not only by the occasional disappearance of an arrhythmia but also by diminution in the size of the T wave and in the pulse-pressure as well as by the general clinical condition.



6. The development of diphasic or inverted T waves, especially in leads I and II, should probably be considered as influencing prognosis unfavorably.

E. B. FREILICH.

**Kocher, Roux, T., and Others: The Operative Treatment and Prophylaxis of Goiter** (Ueber Kropfoperationen bei gewöhnlichen Kropfen nebst Bemerkungen zur Kropfprophylaxis). *Cor.-Bl. f. Schweiz. Aerzte*, 1917, xlvii, 1633.

At the annual meeting of the Swiss Surgical Association, held at Lausanne March 10, 1917, a discussion on goiter took place in which Kocher, Roux, De Quervain, Birch, Kopp and others joined.

With regard to hypothyrosis, Kocher said that the removal of only that part which is absolutely necessary to relieve pressure should be done, and as much as possible of the functioning gland should be left, avoiding ligation of the arteries if possible. With hyperthyrosis the functioning should be checked by ligating the main arteries, enucleating all diseased tissues but sparing the normal tissues.

The whole gland should never be removed. In vascular and exophthalmic goiter it is best to ligate the arteries in two sittings.

In the past fifty years the mortality of goiter has been reduced from 30 per cent to 0.003.

For prophylaxis Kocher recommends adding a small amount of iodine to the drinking water in endemic goiter districts, which with hygienic measures will prevent the development of goiter conditions in children. Kocher quotes statistics to show that army service tends toward the retrogression of established goiter in recruits.

Roux gives a number of charts showing the increase in the number of goiter operations in Switzerland since 1870. Since that time postoperative mortality has dropped from 12.5 per cent to 0.66 per cent. In over twenty thousand cases operated upon in Switzerland, permanent injury of the recurrent nerve occurred in 1.22 per cent, and temporary injury in 0.81 per cent. The greatest postoperative danger was due to pneumonia; but this has almost been eliminated. W. A. BRENNAN.

## SURGERY OF THE CHEST

### CHEST WALL AND BREAST

**Le Fort, R.: Thoracic Hernia of the Lung and Omentum; Repair of the Diaphragm and Closure of the Thorax by Aponeurotic and Fat Graft; Recovery** (Hernie thoracique du poumon et de l'épiploon; réparation opératoire du diaphragme et fermeture du thorax par une greffe aponévrotique et graisseuse; guérison rapide). *Bull. et mém. Soc. de chir de Par.*, 1918, xlv, 95.

A soldier who had recovered from a bullet wound of the chest came to Le Fort with the diagnosis of pulmonary hernia. The entry and exit orifices had healed. There was a thoracic hernia on the left side the size of an orange. On exposure of the osteomuscular orifice by incision along the ribs, the hernia was found to be constituted by the omentum and abdominal organs protruding through a large diaphragmatic opening. Part of the lung also herniated.

On placing the patient in right lateral decubitus Le Fort was able to reduce the herniated organs. He found it possible by widening the intercostal breach to inspect the diaphragm and suture the very large orifice in it with catgut, making a complete abdominothoracic occlusion. A piece of aponeurotic fascia lata a little larger than the thoracic breach was cut from the thigh and wrapped in a compress moistened with warm serum. All subcutaneous fat tissue was left adherent to the graft. The thoracic orifice was 3 finger-widths long, 2 wide, and 1 deep. The graft was fixed in this orifice by eight catgut sutures, the fat tissue turned inward. The violent traumatopnœa, which was present until then, ceased completely. The operative wounds were closed and reunion was complete

after eight days. Twenty-one days after operation the thoracic wall was solid and the patient in good condition.

Le Fort finds that hernia of the abdominal organs through the thoracic wall is not rare in war wounds.

W. A. BRENNAN.

**Roux-Berger, J. L., and Policard, A.: Infection of the Pleura in Chest Wounds; Treatment of Old Suppurations with Pachypleuritis by Pleurectomy** (L'infection de la plèvre dans les plaies de poitrine; le traitement des suppurations anciennes avec pachypleurite par le pleurectomie). *Lyon chirurg.*, 1917, xiv, 969.

In their long, well illustrated and exhaustive report the authors limit themselves to the study of severe and old cases of pleuropulmonary infections complicating war wounds. They consider the curative treatment of such complications extremely difficult, but preventive treatment is easy. In 18 of the 19 cases which form the basis of this report, development and aggravation of the infective complications were clearly traceable to absolute lack of knowledge of the mode of development of infection in pleural and pulmonary lesions. This misconception led either to a policy of abstention or to surgical treatment which was entirely insufficient.

Regarding lung wounds it must be admitted as a fundamental premise that the theory generally accepted in war surgery today is correct, namely, that all such wounds are infected; and that the spread of infection can only be prevented by early and complete operation. Therefore the surgical therapeutics to be applied in every chest wound

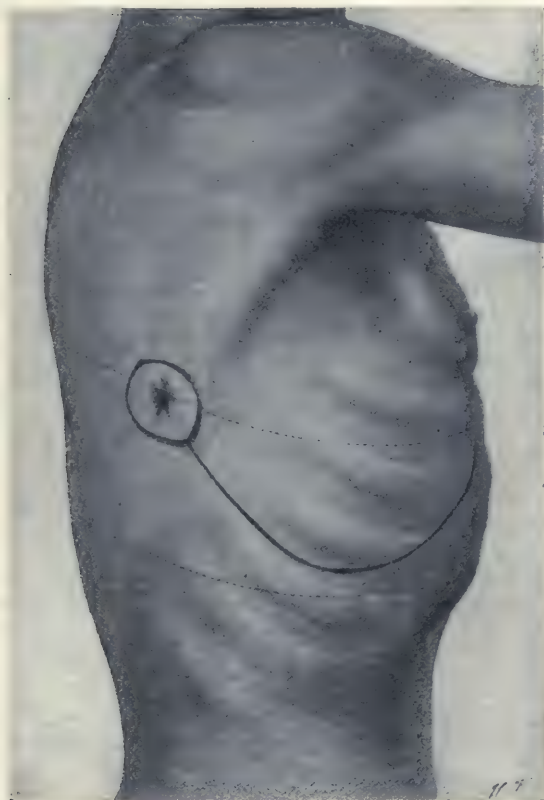


Fig. 1. (Roux-Berger and Policard.)

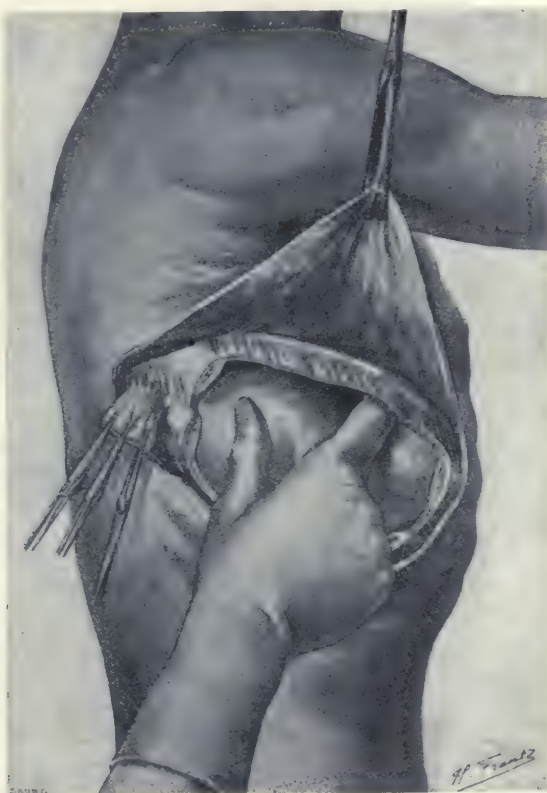


Fig. 2. (Roux-Berger and Policard.)

should be thorough and immediate. It should include: (1) complete removal of the fractured rib, when there is one, the infection of which close to the pleura is the principal cause of purulent pleurisy; (2) extraction of the projectile, whether situated in the pleura or in the lung; only very small projectiles or those situated very far from the orifice can be disregarded; (3) the lung should be sutured and the operative wound closed.

In the authors' 19 cases, a rib fracture, either unrecognized or untreated, was found in 16. Such a fracture, if not the essential factor, is almost constantly found in pleural infections.

The authors have observed that pulmonary infection develops quite independently of pleural infection. The latter is early and rapid. The lung offers a more protracted resistance. The authors think therefore that the immediate danger in wounds of the pleura and lungs, apart from hæmorrhage, arises from infection of the pleura. Later on when effective treatment has removed the cause of pleural infection, the pulmonary insidious and slower infection may continue and protract the condition. The authors therefore insist that the real treatment ought to be such as will prevent pleural infection.

When infection has been established for some time, a cure can hardly be hoped for and only incomplete and mediocre results are obtained. When prompt and thorough treatment is not applied, pleuropulmonary lesions develop, clinically characterized by cachexia and anatomically characterized by a noticeable thickening of the pleura, as well as by the constriction of the lung into a hard envelope and development of lung lesions of the acute bronchopneumonia type.

In fresh wounds of the lung and pleura, prophylactic treatment should follow the general rules of war surgery: resection of the entry and exit orifices and all adjacent tissue, systematic resection of fractured ribs, and minute extraction of foreign bodies, etc. The pleura should always be closed by hermetic muscular sutures. The surgical treatment of the lung itself is limited. Incision of the trajectory and wide resection of all contused tissues is not possible in the lung and hence ideal treatment is not possible. It is limited to the removal of the projectile and treatment of the entry and exit orifices.

In established chronic fistulous pleural suppurations the treatment must include: (1) removal of the infected fractured rib which has been either totally neglected or wrongly treated; (2) previous



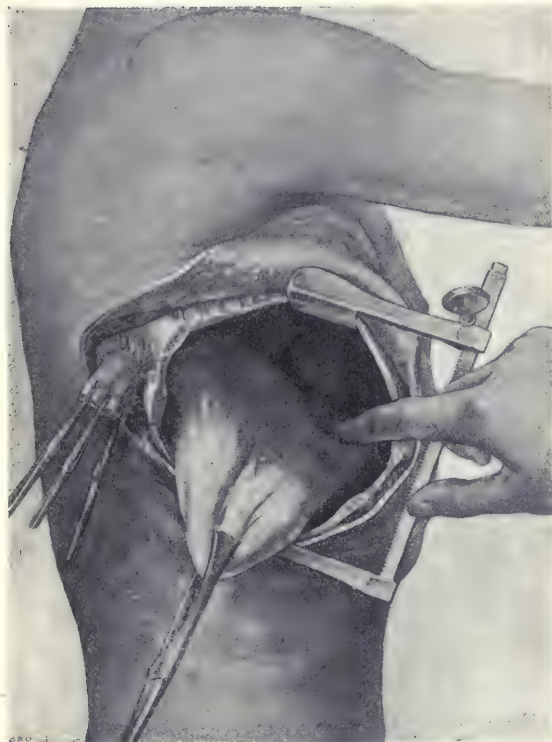


Fig. 3. (Roux-Berger and Policard.)

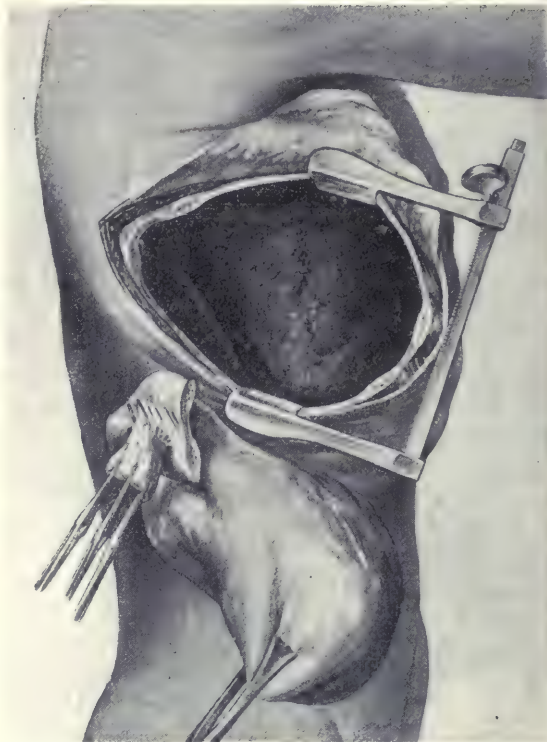


Fig. 4. (Roux-Berger and Policard.)

drainage and disinfecting of the pleural cavity; (3) extensive removal of the parietal pleura; (4) decortication of the parietal and visceral pleura.

In some of their cases the authors tried parietal pleurectomy, in others visceral pleurectomy. The general results were good. They believe that parietal and visceral pleurectomy lose their value if one is applied without the other. The authors have therefore been led to adopt, when possible, total pleurectomy involving the resection of all the parietal pleura and all the visceral pleura in the vicinity of the suppurating cavity. Such pleural resection *en bloc* is only possible when the infected pocket is limited and does not extend to the top of the thorax. Their technique of total pleurectomy is in brief as follows:

The infected pocket is disinfected in the days immediately preceding the operation and its exact location obtained radioscopically. The incision must permit total and easy removal of this pocket.

Fig. 1. shows the incision preferred by the authors which includes the fistulous orifice.

Fig. 2 shows the pleuroparietal exposure. Two ribs are resected for a length of 20 cm. The amount of costal resection will be indicated by the extent of the pocket to be removed. Peeling off the thickened parietal pleura is done with the finger, from above downward. This is continued as far as necessitated

by the limits of the pocket. When done, a Tuffier intercostal retractor is placed.

Fig. 3 shows the retractor in position and the pleuropulmonary decortication being continued on the exterior face of the lung. This is carried down to the diaphragm, and the infected pleural pocket, which is then only retained by the fistulous trajectory, is seized by a clamp.

Fig. 4 shows the extraction of the infected pocket and the fistulous tract by rib resection. The freed lung commences to expand. Any small tears in the parenchyma have been sutured.

The pleural cavity is dried, and the thoracic wall closed. If there is any evidence of pleural effusion, drainage is established. There is usually very little postoperative shock. When the important pachypleural lesions have been totally removed, the most serious obstacle to recovery will have been disposed of, but the fresh cavity in the pleura will have to be constantly drained as long as any signs of infection continue.

The authors carried out total pleurectomy in 4 of their cases. Two died later. In one of those cases autopsy showed total hepatization of the left lung and splenization of the lower half of the right lung, lesions which were hopeless. The other death was due to acute tuberculous bronchopneumonia a few months after operation.

W. A. BRENNAN.

**Spence, T. B.: Chronic Empyema.** *Long Island M. J.*, 1918, xii, 41.

Some surgeons claim that chronic empyema should never occur, that cure of empyema should always be effected during the acute stage of the disease by applying the proper treatment at the proper time. The author states that improved methods have been sought in the conduct of empyema cases and that there should result no permanently collapsed lungs and no persistent pleural sinuses.

Lilienthal has done considerable work in this line and outlines the management of acute suppuration of the pleura. The important objects of the treatment are: (1) exploration of the pleural cavity; (2) mobilization of the lung. He does not mention as an important factor the evacuation of the pus and drainage; however, in critical cases a few days before operation a small incision is made for preliminary drainage.

In making the exploration of the pleural cavity, Lilienthal makes an incision in the seventh or eighth costal interspace extending from the angle of the ribs to the cartilage. The ribs are spread by a retractor and the contents of the cavity are inspected. Adhesions to the lungs are separated, sacculations are searched for and emptied.

Mobilization of the lung he finds necessary in certain cases, as early as ten days after the probable beginning of the empyema. The pleura may be covered with a grayish or greenish membranous exudate which obliterates every landmark. The chest cavity may not even show a bulging to indicate the location of the lung, as it lies compressed against the mediastinum, the spinal column, or the chest wall.

This exudate is incised, freed from the lung, and removed as far as possible. If the adhesions between the lung and the chest wall are not too strong, they also are freed. Drainage is introduced and the skin is sutured. Despite the improved methods and the greater skill and care that is exercised, one still sees cases of pyothorax that have resulted in a permanently collapsed lung, repeated accumulation of pus, or persistent sinuses.

The author has had no great success with Beck's bismuth paste.

In chronic empyema where there is considerable or complete collapse of the lung and a huge cavity lined with suppurating thickened pleura, the prognosis is very bad.

Estlander in 1877 attempted a solution of the surgical problem in these cases. Starting with the supposition that the lung was permanently disabled, he resected large portions of the ribs, thus making a flexible chest wall which could be pressed inward and be made to obliterate the cavity. Later he adopted a more complete procedure, resecting the intercostal muscles and parietal pleura and curetting the pleural covering of the lung. Schede worked out the details of such an operation a little more fully.

No further progress was made until Fowler in

1893, believing that the lungs could expand even after long compression, performed the operation of cutting away the thickened pleura lining, relieving the lung with complete success. Fowler called this operation decortication of the lung. This operation can in some cases be advantageously combined with the Estlander. Ransohoff was of the opinion that the same result could be obtained by making multiple incisions into the pleura. Hæmorrhage after these operations frequently proves serious.

The use of the blowing bottles greatly aids expansion of the lung. The patients are best up and about in the open air as soon as possible after the operation.

The author reports three cases, two operated upon with complete success and one resulting fatally.

P. H. KREUSCHER.

**Jeantelet: A Year of Artificial Pneumothorax** (Une année de pneumothorax artificiel). *Lyon méd.*, 1918, cxxvii, 29.

During the past year Jeantelet has carried out the Forlanini method of artificial pneumothorax, confining his treatment to men with unilateral lesions or with one side only very slightly and the other side markedly attacked. He was able to realize pneumothorax in 34 cases. He found 61.73 per cent of the cases much ameliorated. The time elapsed is still too short to report any permanent cures. Almost all the cases were in the ulcerocaseous stage.

The author thinks that the Forlanini method is much superior to all other methods of treatment in cases to which it applies.

W. A. BRENNAN.

**Dorlencourt and Pachères: Researches on the Incoagulability of the Blood in Traumatic Hæmothorax** (Recherches sur l'incoagulabilité du sang des hemothorax traumatiques). *Presse méd.*, Par., 1918, xxvi, 94.

The experimental researches of the authors have determined that the fluid in hæmothorax is not merely incoagulable but is also anticoagulant. If some hæmothorax fluid is added to fresh blood it makes it definitely incoagulable. The authors attribute the effects to some substance which is added to the blood during its stay in the pleura. This incoagulable substance is also found to have passed in small quantities into the general circulation.

W. A. BRENNAN.

## TRACHEA AND LUNGS

**Milligan, W.: Fibropapilloma of Trachea; Removal by External Operation; Recovery.** *Proc. Roy. Soc. Med.*, 1918, xi, Sect. Laryngol., 52.

The author reports the case of a female of 29 years with gradual and progressive dyspnoea which on examination proved to be due to an elongated growth on the posterior tracheal wall, apparently occupying five-sixths of its lumen. Tracheotomy and cricothyrotomy were done under local anæsthesia



and the growth removed piecemeal, its posterior attachment being cauterized with chromic acid, 40 per cent. Complete recovery followed. Microscopical sections showed a fibropapilloma.

H. H. FREILICH.

**Burket, W. C.: Transplantation of the Trachea.**

*Bull. Johns Hopkins Hosp.*, 1918, xxix, 35.

With the purpose in view of the possible utilization of a tracheal transplant in human cases in which a portion of the trachea had been resected on account of malignant disease, the author undertook to study the transplantation of the trachea in dogs. As a preliminary step in this problem, it seemed to him that an important factor in the success of the tracheal transplants would be the determination of the sterility of the trachea at different levels.

A review of the literature showed the rather extensive work that had been done on the healing of tracheal wounds after resection and the use of various grafts for closing tracheal defects.

On account of the splendid results obtained in several of the cases of autotracheal transplants in dogs, it was deemed advisable to report the following experiments which seemed to divide themselves into two classes; the main division consisted in the auto- and isotracheal transplantation of complete annular segments of the trachea in dogs; and a subordinate division which was undertaken as a preliminary step to the main problem consisted in the determination of the sterility at different levels of the trachea of the cat.

The experiment to determine the sterility of the trachea was as follows: Under ether anaesthesia and after sterilizing the operative field thoroughly with alcohol, the trachea was exposed from the larynx to its bifurcation. Blood for cultures was taken from the carotid artery. Four sets of sterile instruments were used in obtaining the different specimens, as follows: one to expose the trachea and to remove wound muscle as control culture of the operative technique; and the other sets to remove the trachea at three different levels; that is, at the bifurcation, midway up, and just below the larynx, respectively. These tracheal rings and pieces of muscle were placed in broth, in Ringer's solution, in blood, and in 1:100,000 aqueous bichloride solution. Some of the cultures were kept on ice and others at 37° C. Approximately sixty cultures were thus made. All of the control cultures and all the cultures that were kept on ice and later placed in the thermostat remained free from bacterial growth, as did also the cultures that were kept at 37° C., except for a cloudy growth after forty-eight hours in one of the broth cultures from the trachea near the hilus of the lung, which contained a small piece of a lymph gland that probably accounted for the growth. The stained smear of this culture showed a Gram-positive coccus that was not in chains. The remaining cultures of the trachea near the hilus of the lung showed no growth.

With a knowledge of the preliminary facts as

stated concerning the sterility of the trachea, the following experiment in the autotransplantation of the trachea in dogs was made by Burket. The animals were kept under ether anaesthesia by mouth or through a tracheotomy wound. A midline incision was made from the larynx to the suprasternal notch and the muscles separated down to the pretracheal fascia. This fascia contained numerous blood-vessels, which in part supplied the circulation to the intercartilaginous portions of the trachea. These vessels were ligated and divided only over that portion of the trachea which was to be transplanted. A second important blood supply of the trachea was furnished by a vessel upon either side of the trachea and parallel with it; this was ligated just at the point where the trachea was to be divided, in order to preserve the circulation of the trachea to the very line of incision. After careful attention to the blood supply a segment of the trachea composed of from three to nine cartilaginous rings in length was completely separated by transverse incision and removed, thus assuring complete absence of blood supply to the transplant. This autotransplant was then replaced and sutured end-to-end by using three equidistantly placed interrupted black silk sutures, which picked up the perichondrium and cartilage without penetrating the entire tracheal wall.

All animals recovered promptly from anaesthesia and the operation. The skin wounds healed *per primam*. After operation some of the animals had a hoarse voice, a dry cough, and a rather stiff neck. When walking, they would occasionally move the neck from side to side, especially in the case of the dogs with the long transplants. Although otherwise their general condition remained very well, yet after one to three weeks they developed marked symptoms of tracheal obstruction with dyspnoea and died. Autopsy revealed a normal oesophagus and lungs, and a stricture of the trachea at the site of the transplant. Only one animal developed a purulent infection at the site of the transplant, together with a complicating bronchitis and pneumonia which caused death in four days after the operation. In these unsuccessful cases, the dogs with the short tracheal transplants lived from one to two weeks, while the animals with the long transplants lived approximately three weeks. The cases of isotracheal transplants resulted in death with symptoms similar to the unsuccessful cases of autotransplants, and autopsy showed normal lungs with stricture of the trachea at the region of the transplant.

From his experiments the author feels justified in stating that according to the studies with cultures, the trachea was practically in all cases sterile from the larynx to the hilus of the lung; that one of the transplants was an example of a perfect autotracheal transplant (54 days); that in the successful cases the healing took place by the normal layers of the tracheal wall and not by fibrous cicatrix; that there was no infiltration with calcareous salts;



that the strictures resulted from an infection which was caused by the organisms that were observed in the histological sections; that isotracheal transplants resulted in stenosis. GEORGE E. BEILBY.

**McKinney, R.: A Copper Brad in the Left Inferior Bronchus.** *Laryngoscope*, 1918, xxviii, 89.

The author reports the case of a child of five years who had swallowed a copper brad which was removed only after three bronchoscopic attempts. The brad, presenting its smooth surface, could not be grasped by the forceps until it was tipped over. The diameter of the bronchoscope being smaller than that of the brad, the fluoroscope was used to facilitate its removal.

The author emphasizes the point that bronchoscopic maneuvers should not be protracted, the patient being able to undergo several ten- or fifteen-minute attempts without serious injury, while a long-continued attempt at extraction, with the danger of the anæsthetic, should one be used, may cause sufficient trauma to result fatally.

H. H. FREILICH.

**Hansen, P. N.: The Surgical Treatment of Bronchiectasis.** *Nord. med. Ark.*, Stockholm, 1917, 1, Kirurgi, No. 13.

The author has operated upon 10 patients with bronchiectasis. In 7 cases he employed pneumotomy including a more or less extensive rib resection and long drainage. Two patients died after operation, but not as a result of it. Only 1 patient recovered completely; 2 showed marked improvement. He thinks that on the whole incision is rather useless and advises its use only in cases where one large cavity exists.

The author's experience with extrapleural thoracoplasty is that it had no effect whatever on the disease or its symptoms.

In 4 cases he removed the diseased part of the lung. In some of these the other methods had failed. One patient died from pleuropneumonia in the other lung. In this case the lower lobe had been removed. Autopsy showed that there was extensive bronchiectasis in the central lobe which had not been removed. The other 3 patients made as complete a recovery as could be expected.

While thoracoplasty alone is of very little service in bronchiectasis, the author thinks it is quite rational to do more or less extensive plastic work on the chest wall, besides excising the diseased lung tissue.

Robinson of America was the first surgeon to maintain that excision of lung tissue is the only mode of bringing about recovery in bronchiectasis. The author has also obtained the best results from lung resection. W. A. BRENNAN.

**Duval, P.: War Wounds of the Lung.** Masson et Cie, Paris, 1917.

Duval has collected 3,453 cases of lung wounds reported by 37 different surgeons, showing a mor-

tality of 20 per cent. The mortality falls in general with the distance from the front. Hæmorrhage and asphyxia due to mechanical interference with respiration are the two principal causes of death. In the French army all chest wounds are considered as not transportable and are held until in good condition in the first hospital that is equipped to receive them. The high mortality is due to the frequency of wounds by artillery projectiles, in which case the gaping chest wounds give double the death rate seen in the closed wounds.

Bullet wounds infrequently call for operative interference. Shell wounds, if the fragment is small and passes through, may be clean-cut, but if large, may cause ragged, deviating wounds with a large point of exit. The fragment may be retained or passed through; in either case bits of clothing or pieces of rib may be left. The latter often set up severe suppurative pleuropneumonia. The tissue about the wound may be dead, cold, and non-crepitant, and densely infiltrated with blood. It is strange that in so vascular a tissue a lung hæmorrhage is not severe unless large trunks are severed. The opposite lung may by a sort of "contre-coup" and be the seat of marked congestion or purulent pleurisy.

Severe massive hæmorrhages may be immediate or late. The immediate hæmorrhage may be imprisoned and may stop by self-compression but this adds the risk of cardiac and opposite lung embarrassment. These hæmorrhages may recur after transportation. It is in this way that late intrapleural hæmorrhages occur. Hæmorrhage and shock are difficult to differentiate. Aspiration is a valuable aid in determining bleeding, but X-ray is of value only when the patient is sitting. The blood-pressure readings, taken half-hourly, if falling indicate hæmorrhage, which demands operative interference with an attempt at direct hæmostasis. Duval has 70 per cent of recoveries in 21 desperate cases of this type.

Bullet wounds and small shell fragment wounds not complicated by bits of clothing, etc., frequently have a sterile evolution but are often complicated by pulmonary congestion or mild pleuropneumonia.

Wounds by large shell fragments, particularly if bone splinters have been carried in, are practically always followed by a grave anaerobic infection. If the lung is collapsed by a hæmothorax, it does not readily become infected but the pleura and blood bear the brunt of the activity. But if the amount of blood is small or if old adhesions prevent collapse, the lung suffers from bronchopneumonia, septic pneumonia, abscess or gangrene. True gas gangrene of the lung has not positively occurred in Duval's practice, but a wide variety of anaerobes and aerobes may be present and active.

Hæmopyopneumothorax, either free or loculated, is always grave and often fatal. The lung itself is resistant to anaerobic infection, so its wounds may be closed in order to protect the pleura.

Duval was among the first to assert that one



should treat from the very outset wounds of the lung just as he treats wounds of the soft parts elsewhere. The pathology is identical and the fear of pneumothorax is unfounded. One may eventrate the lung lobe by lobe just as one does loops of intestines, palpate, incise, resect and replace within the thorax.

Projectiles may be removed with forceps, or if almost a through-and-through penetration, the lung may be incised over it. Simple removal of projectiles does not suffice. Excision of the wound is not always possible, but in wounds near the surface it is ideal. The tract may be cleaned by stripping gauze through, which drags out foreign bodies and necrotic tissue. The pleural orifices are closed to protect the pleura.

Operation should be done as early as is compatible with the patient's general condition, but thoracotomy is not accompanied by the shock of laparotomy, and because of the rapid septic evolution of shell wounds of the lung, the operation should not be deferred too long.

Bullet wounds cause operative indications only in case of large vessel section and urgent hæmorrhage. Wounds from very small projectiles stand midway between bullet and large shell fragment wounds.

The term "open thorax" is used to describe those cases in which the offending missile has left a gaping wound in the thoracic wall. This gaping wound must be closed in order to overcome the resultant mechanical embarrassment of respiration and the resultant pleural infection. As a matter of fact, closure is to be considered as an emergency operation. Thévenot has practiced this type of closure 109 times, with a mortality of 24.7 per cent and a subsequent pleural infection in 8 per cent of the cases. The reason for this high mortality rate is that, according to Thévenot, the closure of the thoracic wound is regarded as the essential thing and the fact should be appreciated that such an operation is in reality an incomplete one. Unless the lung itself is attacked, hæmorrhage checked, foreign bodies removed and a sepsis combated, one can hardly hope for other than a high mortality.

The first point of importance under operative technique is that there should be no fear of operative pulmonary collapse. Methods of combating pneumothorax at operation are rational, but they are very inconvenient to perform, and if practiced, one must make up his mind that it will be impossible to relieve injuries of the lung. If used, either the positive or negative pressure chamber keeps the lung inflated and it must be collapsed.

It is necessary to handle the lung, to inspect it, to incise it and to swing it around on its pedicle. In order to do these various things, the lung must be in a state of collapse. All of the maneuvers described above, namely, the seizing of the lung with the forceps, separation of adhesions, traction on the pedicle, if made with gentleness, have no influence on the respiration or heart action. The

respiration maintains its normal rhythm, frequency, and amplitude.

The heart is not in the least excited, and Duval has never observed any reflex disturbance of cardiac rhythm. Thoracotomy with manipulation of the lung is not a shock operation. Indeed, even those cases that come to the field hospital in a state of moderate shock should not be held until the blood-pressure completely re-establishes itself, but one should rather hasten operative intervention in order to complete it before the lung enters the stage of inflammation.

The question of anæsthesia has not been definitely settled. General anæsthesia is, of course, treacherous in these cases, and local anæsthesia is in a measure inadequate, but when local anæsthesia can be used, it is the method of choice.

The chest may be opened by one of two procedures; either by making a thoracic window, or by the extensive resection of one rib. Duval has always contented himself with a simple resection of 10 cm. of one rib, followed by forcible retraction of the neighboring rib, above and below. In operations performed for the late removal of foreign bodies, the chest should be opened at the point nearest to the foreign body, but the early emergency operations call for extensive incision, so as to permit a thorough inspection of the entire lung. One should plan this incision rather with this object in view than with any preconceived notion regarding drainage of the pleural cavity. It is almost beyond question that the antero-external incision running from the axillary to the parasternal line in the neighborhood of the fifth rib gives the best exposure of the whole lung. It goes without saying, of course, that special lesions such as rib fracture call for special treatment and even demand a second incision.

The French refer to the delivery of the lung as exteriorization. When the rib has been resected, the imprisoned air of the pneumothorax rushes out in gusts. It is well to pay no attention to this and not to attempt to extract all the air but to proceed at once to treat the lung wound, leaving the removal of intrapleural air and blood for a later stage of the operation. The lung is gently seized with a light, elastic, non-crushing fenestral forceps, and by gently swinging, rotating movements, the lobe is exteriorized. It is received immediately in warm, moist compresses, and is thereupon carefully inspected on all its surfaces. After the lesion is located, the thorax opening is plugged by a thick gauze compress in order to obviate the to and fro movements of air during operation. The wound is then dealt with appropriately in accordance with the methods described, and the other lobes treated in turn, provided they have been injured.

It is necessary to operate as gently and quickly as possible and to get the opening in the chest wall closed at the earliest possible moment. In case there should be any evidence of mechanical interference with breathing, it is advisable rapidly to deliver the lung, plugging the chest wall with gauze. This



procedure is usually followed by cessation of all respiratory embarrassment.

In case the lung is bound down by adhesions, these are divided gently and bluntly, if possible; by sharp division if necessary.

In combating hæmorrhage, three methods may be used: the tamponade, suture, or ligature.

Tamponade is not to be advised except in cases where the wound is inaccessible on account of old adhesions or where the wound is large and the infiltrated lung tissue so friable as not to hold suture or ligature.

Ligature requires no explanation. It is the ideal method of hæmostasis.

Suture, however, should be explained, as it is in a large number of cases effectual even when it is used merely to close the opening of a blind wound or the openings of a through-and-through wound. According to Duval, this method seems illogical, but has worked excellently in his hands.

The presence of foreign bodies in the lung requires special mention. Radioscopic examination furnishes evidence regarding the presence of metallic foreign bodies, but unfortunately does not disclose the presence of bits of clothing or even fairly good-sized bits of fragmentary bone. The infiltrated hæmorrhagic lung does not permit one to palpate with any degree of certainty bits of clothing, moderate sized bone fragments, and often even bullets.

Metallic foreign bodies may have to be removed under some circumstances, with the aid and under the control of the radioscopic screen. The foreign body is grasped by forceps inserted in the lung wound or through a deliberately made new incision in the lung substance. The wound should always be gently cleansed with a strip of gauze in order to remove possible foreign bodies disclosed by X-ray examination, or removed by use of forceps.

After the foreign bodies have been removed and the necrotic lung tissue cleaned away by the gauze strip, or when possible after a clean excision of the wound has been made, the lung wound is sutured. Care must be taken to include the depth of the wound in the suture, and to carefully approximate the pleural edges. These sutures should not have too wide a bite. This is in order to guard against their tearing out of the lung substance during inspiration.

After the lung has been carefully attended to, the pleura and pleural cavity demand attention. The lung is replaced in the pleural cavity and gentle attempts are made with gauze sponges to mop out every vestige of intrapleural blood and blood-clot. It is, of course, impossible to remove all the intrapleural air as long as the chest is open. Since it is desirable, however, for the sake of the patient's comfort to get all this air out, Duval recommends that it be aspirated with a syringe after the chest wound has been completely closed. This closure of the chest wall must be done very carefully in order to avoid a leakage of air; the resected rib ends should be covered with muscle to get an air-tight lobe.

One must bear in mind that although the operation as described is sometimes remarkably simple, it is nevertheless exceptional for these patients to run other than a rather stormy postoperative course. Pulmonary congestion is particularly frequent, and if it occurs on the opposite side also, is almost always fatal. Pain, restlessness and groaning are practically constant postoperative occurrences. The respirations are rather shallow, the pulse small and rapid, and the expectoration bloody for the first day. It is necessary that these patients should be kept in a semi-upright posture and be judiciously morphinized. The temperature, which is elevated after operation, usually returns to normal about the fourth or fifth day, and if any air is left in the chest, it is usually entirely absorbed at the end of the fifth or sixth day. Sometimes the pleural reaction is manifested by a chill, followed by a serofibrinous or hæmorrhagic pleurisy, which is spontaneously restored.

From all of this it is evident that postoperative care constitutes a most important chapter. These patients must be made comfortable, and it is much more difficult to do this in war hospitals than it is in times of peace. They should be placed in a special ward where the temperature is constant and kept constantly above the usual normal level, where there are no currents of air. This ward should be near the operating room, or at all events connected with it by an enclosed warm passage-way. These patients should furthermore be kept well protected by warm coverings and should not be permitted to breathe dry, cold air. It is advisable immediately after operation that they be placed in an especially warmed bed.

**Cumston, C. G.: Intrapulmonary Wounds from Projectiles.** *N. Y. M. J.*, 1918, cvii, 362.

The pulmonary parenchyma usually has a tolerance toward the projectile embedded in it, once the inflammatory storm following the pulmonary trauma has subsided. Every penetrating wound with or without lodging of the projectile is accompanied by a focus of pneumonia associated with a hæmothorax, the so-called hæmopleuropneumonic syndrome of Piéry. Intrapulmonary retention of the projectile may be followed by the more acute sequelæ of empyema, pulmonary or mediastinal abscess, hæmoptysis due to the injury to vessels by the constant motion of the foreign body, and also by the more chronic symptoms of pain, dyspnœa, and tachycardia.

Operation for the removal of foreign bodies embedded in the lung is not so simple that it may be resorted to lightheartedly. It is a far better practice to wait until some complication sets in. Among these complications may be mentioned gas gangrene, tetanus, particularly the chronic type, pulmonary abscess about the missile, and hæmoptysis. Occasionally persistent pain may be an operative indication. It is best to delay operation whenever possible until acute symptoms have subsided.



It must be borne in mind that opening the pleura may easily transform a quiet inoffensive hemothorax into a severe grade of empyema. Operative pneumothorax, although not devoid of danger, is not nearly so serious a factor as was formerly supposed. One of the best means of avoiding total pneumothorax is immediately to pull the lung into the thoracic incision.

R. B. BETTMAN.

**Beck, E. G.: Sutureless Skin-Sliding Method for the Radical Treatment of Lung Abscess and Chronic Osteomyelitis.** *Surg., Gynec. & Obst.*, 1918, xxvi, 259.

The author notes the increased number of chronic suppurative infections due to war injuries, and suggests treatment based on an experience with cases originating from various infective sources. Lung tissue is particularly favorable for the growth of infective organisms, and the foreign bodies from war injuries almost invariably give rise to subsequent pyothorax.

The diagnosis of empyema and of lung abscess is discussed, special emphasis being placed on the value of the stereoroentgenogram in the diagnosis of lung abscess. The importance of low drainage in empyema is mentioned. With most careful drainage, some cases discharge for years. Four out of five cases of this class may be cured by the injection of bismuth paste. Ten per cent bismuth-vaseline paste is used, stereoroentgenograms being taken first to ascertain pathology accurately, and after injection for further study of the filled cavity. Repeated injections over several months may be necessary for therapeutic results, injections being stopped when the discharge changes from a purulent to a serous character. Cavities holding more than 200 grams or communicating with bronchi seem less likely to heal by bismuth injection.

For cases not responding to the injection of paste, the author advises the sliding skin flap operation. The technique of this operation is fully described, emphasis being laid on the importance of free exposure by rib removal. Cuts illustrate the variety of skin flaps necessary for implantation into the abscess cavity, after the latter is thoroughly cleansed with gauze and the walls scarified to promote adhesions. Gauze packing is used to press the skin flaps against the cavity walls and gauze covers the denuded surfaces. No sutures are used.

In lung abscess with open bronchus, it is advised in addition to the above procedure, that the actua cautery be used on the bronchial mucous membrane, to insure complete obliteration of the opening. To prevent fire, ether anaesthesia must be discontinued for a time and oxygen substituted to free the passages from ether.

The same principle as is used in the above cases the author suggests as being practicable in chronic suppurative osteomyelitis. Bismuth paste treatment should be given a trial first, and in more than 65 per cent of cases is effective.

Beck advises against the preparatory flushing of sinuses with watery solutions. The bismuth treatment will be ineffective unless all sequestra are first removed. These should be thoroughly defined by roentgenograms. For diagnostic purposes the injection of paste is recommended as being by far more reliable than the probe.

For cases resisting the paste treatment, the skin sliding operation is recommended, and the detailed technique is described by the author. For the areas denuded by the skin flaps, adhesive strips are used to promote epidermization.

V. E. DUDMAN.

## PHARYNX AND OESOPHAGUS

**Robinson, E. F.: Stricture of the Oesophagus; Successfully Dilated from Below Upward Through a Gastrotomy Opening.** *J. Missouri St. M. Ass.*, 1918, xv, 14.

The case reported by Robinson is of a girl twenty-one years of age who since birth had not retained solid food. A meal taken would be vomited four to six hours later.

X-ray examination revealed a large oesophageal pouch two inches above the diaphragm. A faint, fine shadow about the size of a small knitting needle could be traced from the pouch into the stomach. An effort was made to pass silk thread through the stricture but without success.

An operation was performed through the abdominal route. The stomach was exposed and a gastrotomy incision was made. A rubber tube was passed from the stomach into the pouch and carried into the oesophagus. A thread was then fastened to the rubber tube and carried out through the mouth. This was left in place and was used as a guide for future dilatation.

M. A. BERNSTEIN.

## SURGERY OF THE ABDOMEN

### ABDOMINAL WALL AND PERITONEUM

**Okinezyk, J., and Daudin-Clavaud, H.: Forty Operations for Penetrating Abdominal Wounds** (Quarante opérations pour plaies pénétrantes de l'abdomen). *Bull. et mém. Soc. de chir. de Par.*, 1918, xliv, 300.

Of 64 cases of abdominal wounds mostly multiple received at the authors' ambulance, 22 died in a

state of shock within a few hours without operation; 2 others treated expectantly on account of the benign nature of the injuries recovered. Forty cases have been operated upon with 20 recoveries and 20 deaths. The season of the year has a particular effect which is not a mere coincidence. There is a mortality of 60 per cent in the cold season, as compared with 40 per cent in the warm season.

The authors have operated whenever the pulse was perceptible. Neither the apparent gravity of the injuries nor their extent nor multiplicity has deterred them. Fifteen of the 40 cases had a single abdominal wound; 25 had at least two and the others varied from four to twenty wounds. Multiple wounds gave a mortality of 68 per cent, as against 20 per cent for single wounds.

The authors draw particular attention to the gravity of liver wounds, even if isolated. They have seen such patients die in less than twenty-four hours without any sign of peritonitis.

The authors give particulars of 20 cases which recovered in order to show that abdominal wounds apparently of a hopeless character can recover under immediate operation. There is practically no difference in the nature and extent of the lesions between those that recover and those that succumb. A few of these cases are selected; for example: (a) 7 perforations of the small intestine, with wounds of the face, etc.; (b) 4 perforations of the small intestine; 1 perforation of the transverse colon, 1 perforation of the stomach, wounds of the left kidney; (c) 8 perforations of the small intestine, perforation of the omentum, 2 perforations of the descending colon, concomitant wounds of the neck, shoulder, thorax and arm; (d) 1 perforation of the colon; a tear of the mesocolon, 2 perforations of the small intestine; 1 kidney wound. The average time elapsed between injury and operation was seven and one-half hours.

The first attention given to these wounded is warmth. They are kept in a temperature varying from 45 to 50 degrees. Injections of camphorated oil, adrenalin and morphine are made half an hour before operation. Ether or chloroform is used as an anæsthetic. A supra- and subumbilical incision is used to enable the whole abdomen to be explored. On opening the abdomen, lesions of the small intestines are most constantly recognizable by their dilatation and paralytic atony. Such intestinal loops are isolated and exteriorized protected in compresses. A general exploration is made before treatment in detail is begun. After resection end-to-end anastomosis is preferred to the lateral. It saves time and the results are more satisfactory. Silk is used for suturing.

The authors have entirely discontinued lavage of the peritoneum with ether owing to the abrupt fall in pressure. Warm salt solution is used. Drainage is suppressed as it has been found useless or even hurtful, but occasionally the Douglas pouch is drained for from twenty-four to forty-eight hours. As far as the conditions permit, concomitant wounds, removal of projectiles, etc., are attended to at the primary operation.

W. A. BRENNAN.

**Cosens, W. B.: Reflex Phenomena Produced by Commencing Abdominal Hernia.** *Practitioner*, Lond., 1918, c, 155.

After examining over 20,000 English and German soldiers, it is the author's opinion that bubonocoele

is the first stage in the development of a hernia, the presence of a hernia indicating the failure of the surgeon to recognize the early phenomena which are reflex and consist of uneasiness in the epigastrium, but not actual pain, discomfort of a dragging character referred to one or the other costal margin or its immediate neighborhood, pain in the back corresponding to the ninth and tenth ribs, nausea but no vomiting, and often constipation. Seldom is there any discomfort below the umbilicus. Sometimes the skin is more sensitive on one side of the abdomen and occasionally there is slight tension over the upper segment of the rectus. When the patient stands with feet together and head up, if equal pressure over both inguinal rings is applied, he complains of tenderness on the side on which the above symptoms are present. The treatment consists of a lightly applied truss or radical operation.

H. H. FREILICH.

**Payne, M. J.: An Improved Technique for the Repair of Inguinal Hernia.** *South. M. J.*, 1918, xi, 243.

In employing an improved technique for the repair of inguinal hernia, the author adopts in the main the essential principles of the original Bassini operation.

1. In the modification proposed the cord is laid on top of the line of sutures in the deep layer of Poupart's ligament, and the inferior aponeurotic flap is then united to the muscular flap of the internal oblique and transversalis muscles, to the external margin of the rectus and conjoined tendon (preferably by interrupted sutures), observing special care in placing the suture to make some tension on the inferior aponeurotic flap, in order that a relaxation of the tension on the deep suture line may be obtained.

2. The superior aponeurotic flap is now united to the anterior surface of the inferior aponeurotic flap, giving a wide area of approximation.

3. The fascia, fat and skin are united.

It is believed that the improved technique in principle and effect accomplishes the following:

1. It permits a relaxation of tension on the line of sutures, apposing the muscular structures to Poupart's ligament. The principle is that of a "guy rope."

2. It allows a wider and easier approximation of tissue.

3. It implants an additional layer of tissue in front of the deep ring.

4. It furnishes a more convenient source of obtaining fascial support than flaps taken from the rectus sheath.

5. The relaxation of tension on the structures is more easily and more certainly accomplished.

6. It lessens pressure upon the spermatic cord, a frequent cause of discomfort after operations for hernia.

7. The relaxation of the tension on the deep suture line allows the regeneration of tissue to be more



certain and therefore the union between the parts is more capable of resisting the effects of immediate and remote strain.

8. The special feature of the modification suggested is a reinforcement of the wound, by uniting the lower aponeurotic flap to the deep or muscular structures.

In addition to this special feature, the various structures brought into apposition are more readily overlapped, at the same time relaxation of tension on the most important suture line is easily accomplished.

E. C. ROBITSHEK.

### GASTRO-INTESTINAL TRACT

**Balfour, D. C.: Cautery Excision of a Gastric Ulcer; Further Observations on the Value of the Method.** *Tr. Am. Surg. Ass., Cincinnati*, 1918, June.

The author bases his observations on 214 cases of gastric ulcer in which the cautery has been employed in the Mayo Clinic, showing the advantages of cautery excision and briefly comparing its results with those of other standard methods, particularly knife excision.

The first group of cases in which the cautery was applied comprised the lesser curvature ulcers in such high situations or so extensively indurated as to make knife excision an operation of difficult technique or poor surgical judgment. Under the circumstances, although gastro-enterostomy alone could be counted on to relieve the symptoms in a certain percentage of persons with such ulcers, the advantage of being able, without additional risk, to destroy the crater of the ulcer, and to sterilize the infected area by means of the cautery, was perfectly obvious. The results in this group of cases were very satisfactory and the employment of the cautery was carefully extended so that at the present time, in a large percentage of gastric ulcers, the method appears to be the one of choice.

There are certain limitations in the method which should first be noted; chiefly, that it is not applicable to those ulcers which have definitely undergone malignant change unless the lesion is irremovable because of its size, situation or fixation, and that the procedure should be carried out only after the stomach has been sufficiently mobilized to enable safe exposure.

The value of the cautery in gastric ulcer seems to depend largely on two factors, namely, heat and perforation. The efficiency of heat as a sterilizing agent in infected fields is well known, and since Rosenow has demonstrated the elective localization of streptococci in gastric ulcer, the application of heat in such an infectious process is clearly indicated.

Complete perforation by the cautery point through the center of the crater of the ulcer has been made an essential in the technique because of the clinical fact that spontaneous and complete perforation of a gastric ulcer is, presupposing recovery from this accident, quite likely to be followed

not only by the cure of the ulcer, but by the cure of the patient. The frequency with which nature attempts perforation is shown by the fact that in a very high percentage of ulcers a protected perforation has occurred by the time they come to the operation. The cautery technique will almost always reveal a minute but very definite point in the thickened gastric wall which marks the site from which the leakage has occurred, indicating the center of the crater of the ulcer and serving as an excellent guide for the introduction of the cautery point. Cautery puncture, combining as it does the beneficial action of heat with an artificial perforation, possesses a double efficiency and it is undoubtedly to these two factors that the success of the method is largely due.

The most important advantage of cautery excision concerns its application in ulcers of the lesser curvature.

Clinical experience bears out the observations of Barber and Stewart that excision of a segment of lesser curvature does definitely impair gastric motility, for it is now well known that excision alone of a lesser curvature gastric ulcer frequently fails to completely relieve symptoms, and in order to obtain the best possible results, such an excision must always be combined with gastro-enterostomy. Cautery excision, on the other hand, reduces to a minimum interference with the future motility of the stomach. Carman, in roentgenologic studies of the stomach following different types of operation, has recently demonstrated that cautery excision and gastro-enterostomy give much better motility and function and results in much less deformity than does knife excision and gastro-enterostomy. This fact can hardly be over-emphasized.

The author believes that any inefficiency of the cautery, in cases in which early and unrecognizable malignant change has taken place, is more apparent than real. It has been found in the 1,004 patients operated upon in the clinic for gastric ulcer that in those individuals dying months or years later from what was known to be gastric cancer, the operative reports almost invariably stated that malignancy was strongly suspected, the lesion was not safely removable, and a gastro-enterostomy only had been done. The practice is also made in the clinic of shaving off a portion of the ulcer base or rimming out the crater for microscopic examination before using the cautery, with immediate resection, if the ulcer is malignant and operable. The fact, too, that the cautery can be used in a large group of cases in which excision is impracticable more than offsets any disadvantages of the method when used in excisable cases. The destructive action of heat on the cancer cell is so positive that it is not unreasonable to hope that in some of these large irremovable ulcers which have already taken on early malignant change in the ulcer base, the thorough cauterizing of the base may destroy these cancer cells and prevent an otherwise certain death from cancer later.



Sufficient experimental evidence was originally obtained to show that no marked difference in rapidity of repair was noted in the line of closure following cautery excision and knife excision.

The author cites one case in which an opportunity was obtained some months after cautery excision of a large and indurated gastric ulcer to observe the condition of the stomach. There was practically no evidence that a lesion had ever been present, and the induration had entirely disappeared.

The operative mortality of cautery excision and gastro-enterostomy has been, in the series of 186 cases, 1.1 per cent. In the 2 deaths, the operative field was in perfect condition. Knife excision and gastro-enterostomy in the series of 89 cases showed a mortality of 3.3 per cent.

The convalescence of the patients in whom cautery excision and gastro-enterostomy are done is uniformly smooth, and the clinical postoperative course bears out Carman's observation that better gastric motility is attained than in those operations which entail greater damage to the musculature of the stomach. The reports of the late results, as they come in, are most favorable. Of the 61 cases in which the cautery was used in 1914 and 1915, there is positive information in 55. In this number there have been 4 deaths from all causes since operation, 2 already mentioned following operation, the other 2 of unknown causes at their homes in the three or four years after leaving the clinic. Of the remaining 51 cases operated upon in the two years, 80 per cent of the patients report a satisfactory result, 18 per cent were improved in the sense of amelioration of symptoms present previous to operation, while in no instance did a patient report that he had not obtained relief from the operation. The cases of knife excision and gastro-enterostomy in this period show corresponding figures of 70 per cent and 15 per cent, while 15 per cent of the patients state they are no better. These figures of mortality and late results have more force when it is remembered that knife excision cases are essentially selected, inasmuch as this operation is done only when conditions are favorable, while the cautery is often employed in the very case in which excision is unwarranted because of the size, fixity, and situation of the ulcer.

The experience in the clinic with the cautery has shown that this wide excision is just as unnecessary as it is in the treatment of infectious foci elsewhere, and that the indurated area can be restored to a healthy condition by destruction of the crater, and thorough heat sterilization of the surrounding tissues, as the cautery is held in the punctured crater so that knife excision under such circumstances, necessitating as it does complete removal of the indurated area, is an unsatisfactory procedure if some substitute is available which will accomplish as much without unnecessary sacrifice of gastric wall.

The apparent advantages of the method may be summarized as follows:

1. The cautery efficiently destroys the focus of infection in gastric ulcer without the sacrifice of nature's protective induration surrounding the ulcer crater.

2. It may be applied in a large percentage of gastric ulcers.

3. It entails a minimum of operative risk.

4. Clinical and roentgenologic evidence shows better motility and function than follow knife excision and gastro-enterostomy.

5. It has a particular efficiency in obviating early and late postoperative hæmorrhage.

6. The late results are better than those obtained by any other method.

7. It can be used in cases in which no other means of direct attack on the ulcer is justifiable.

8. It is probable that in gastric ulcer, cautery, like knife excision, should always be combined with gastro-enterostomy.

**De Buys, L. R., and Henriques, A.: Effect of Body Posture on the Position and Emptying Time of the Stomach.** *Am. J. Dis. Child.*, 1918, xv, 190.

The effect of body posture on the motility of the infant's stomach was studied. No matter what the position of the stomach, the gas bubble always rose to the highest point of the stomach. In twelve cases examined in the prone, supine, erect, lateral, right and left positions, it was observed that the stomach emptied itself in from two to three hours.

In these observations the child was given its customary food with barium sulphate, the amount varying from 100 grains in a six-weeks-old child to one ounce in a five-year-old child. The barium was thoroughly mixed with the food. In no instance were any untoward effects noted. The Coolidge tube was used and screen tracings made.

The results obtained were as follows:

In a comparison of right and left lateral positions, the right showed increased motility. In a comparison of the right lateral with the supine, prone and erect positions, the motility was greatest in the right lateral position.

Comparison of other positions was interfered with by colic, but motility in the majority of the remaining experiments seemed to indicate greater motility in the left lateral position than in the supine.

I. E. BISHKOW.

**Barber, W. H.: Gastro-Enterostomy; the Stoma and Efferent Loop.** *Interst. M. J.*, 1918, xxv, 84.

In some cases only an "interval" or temporary functioning of the gastro-enterostomy opening is all that is required. In these cases the author states that almost any opening between the stomach and jejunum will suffice. But when the obstruction at the pylorus is permanent, a properly placed stoma joined to an isoperistaltic loop of proximal jejunum will afford the greatest degree of postoperative comfort.

By experiments on dogs it is shown that the mid-fundic, transverse stoma interferes most and a



pyloric vertical least with the peristaltic wave and that while the gastric contents may gravitate from the midfundic opening, it is propelled from the vertical pyloric opening. The direction of the dejecta from a pyloric opening is in the direction of the stomach's drive, from left to right. It thus seems reasonable that an attachment of the jejunum downward and to the right which throws the gastric-emptying peristalsis in line with jejunal-continuing peristalsis will give the best results.

The following recommendations are made:

1. For normal or hypertrophied stomachs, the nearer the artificial stoma coincides with the physiologic point of outlet, the greater is the efficiency of the stoma. The stoma should be a perpendicular one.

2. For stomachs dilated beyond apparent hope of regeneration, the transverse midfundic stoma seems most efficient.

3. For moderately dilated stomachs in which an appreciable return of original tonus may be expected, a perpendicular antral stoma seems most efficient.

4. Whenever possible, the jejunum should be so chosen that the portion to be anastomosed falls naturally along the line of the proposed gastric opening. Excepting in atonic stomachs, in most instances the course of the efferent loop will be downward or downward and to the right.

The technique of gastro-enterostomy is as follows: The gastric stoma is made in the pyloric antrum in line with the vertical portion of the lesser curvature. The jejunal loop, as short as feasible, is attached with the efferent portion downward or downward and to the right.

S. A. CHALFANT.

**Smithies, F.: Gastric Function Following Gastro-Enterostomy; an Analysis of 273 Cases.** *Surg., Gynec. & Obst.*, 1918, xxvi, 275.

Of 8,826 individuals with digestive disorders, Smithies had 273 undergo operation for gastro-enterostomy. This group represents 11.6 per cent of 2,360 cases upon whom operation had been done for diseases of the stomach and duodenum.

These cases were gastric ulcer, 571; duodenal ulcer, 1,469; gastric cancer, 320. Of the 273 cases composing this series, 170 were male and 103 female. The average age at which gastro-enterostomy was done was 44.3 years for males and 41.5 years for females. These cases returned for postoperative examination from a few weeks to nine years after operation.

In 95.4 per cent of cases the operative procedure was posterior gastro-enterostomy with or without pyloric closure or local or extensive gastric resection, and combined with removal of the appendix or with drainage or removal of the gall-bladder. In 4.24 per cent a posterior gastro-enterostomy was employed and in one case due to faulty anatomic orientation a gastro-ileostomy was done under the impression that a gastro-enterostomy had been done. This patient lived nearly a year.

In those cases seen shortly after operation one would not expect total restoration of gastric function; 20.9 per cent were free from complaint; 49.8 per cent were clinically comfortable, and in 87.89 per cent subjective benefit had resulted.

There are a series of tables classifying the results of the operations, grouped under the following headings: clinical condition of patients; post-operative symptoms in patients not dyspepsia-free; objective evidence of digestive malfunction; test-meal observations; observations upon gastric acidity; other chemical test-meal observations.

I. E. BISHKOW.

**Lewisohn, R.: Clinical and Experimental Studies on Congenital Pyloric Stenosis.** *Surg., Gynec. & Obst.*, 1918, xxvi, 318.

Congenital pyloric stenosis is due to a malformation of the pylorus with secondary oedema. The clinical symptoms are incessant vomiting, loss of weight, constipation, palpable tumor and visible peristalsis. The presence of a pyloric tumor is pathognomonic, but in the absence of this, the other symptoms are sufficient to warrant the diagnosis. If proper diet, paregoric and other medical remedies fail, operation is indicated, though the mortality is high.

Until a few years ago, gastro-enterostomy was the only operation done, but in 1913 Rammstedt's operation became popular because of its apparent simplicity, although it is quite dangerous. This operation consists in making a longitudinal incision through the thickened and hardened pylorus, through all layers down to but not through the mucosa. If the incision fails to divide all fibers, it does not relieve; if it extends a trifle too far on the duodenal side, perforation of the thin duodenal wall with resultant disastrous consequences is almost inevitable.

Lewisohn performed a series of operations on dogs to demonstrate the histologic result of the Rammstedt operation. The following conclusions were drawn:

Following an incision of the pylorus through serosa and muscularis, there is evidently a gaping wound produced, which fills with blood-clot, to which the omentum becomes adherent. This clot is replaced by fibrous tissue, which, when it contracts, brings the cut muscle ends into such close apposition that they may only be separated by millimeters. Regeneration of the smooth muscles does not seem to occur.

LISTER TUHOLSKE.

**Andrews, E. W., and Mix, C. L.: A Case of Duodenal Ulcer; Its Diagnosis and Treatment.** *Surg. Clin. Chicago*, 1918, ii, 1.

Andrews and Mix report a case of duodenal ulcer, the latter covering the diagnostic phases of the case and the former reporting the technique of the operation and the operative findings.

The patient was a young man of twenty-three, with a negative past and family history. He com-



plained of a heavy distress in the epigastrium, made worse by the ingestion of food and relieved only by bicarbonate of soda and oxide of magnesia. He also complained of some nausea without vomiting, and eructations of sour and acrid stomach contents. He had lost about 20 pounds in weight in two years. This trouble had been present about three and a half years, during which time he was on medical treatment, with no permanent relief.

Examination of the stomach contents showed a total acidity of 53, free hydrochloric acid of 37, but no blood. Blood was found in the feces after a meat-free diet. Urine and blood examinations were negative.

Fluoroscopic examination showed barium and buttermilk passing freely down the œsophagus into the stomach. In the stomach the barium sank to a very low level, almost to the left iliac fossa because of the great elongation and downward displacement, which was of the fishhook type. The pylorus was rather fixed when manipulated by pressure on the abdomen. Examination of the movements of the stomach showed an exaggerated hypermotility.

X-ray plates were then taken immediately and at intervals of fifteen minutes and five hours. The first plate showed a very much elongated stomach with a large gas-bubble at the top. The pyloric area was somewhat contracted. There was no distinct duodenal cap, though the plate clearly showed the bismuth passing into the duodenum. The second plate showed a very marked contraction in the region of the pylorus. The third plate showed a marked five-hour retention.

Mix considered the history clearly indicative of a stomach ulcer, but believed that the X-ray plate, with its absence of duodenal cap and apparent localization of a patch of bismuth in the duodenum, was strongly suggestive of a duodenal ulcer.

In presenting the case he discusses each symptom and explains its relation to the diagnosis. He brings out a point in regard to the presence of gas in the stomach which is of interest to the layman as well as to the physician. He says the symptoms of gas and belching are common to all abdominal diseases associated with hyperacidity, and that in all of these conditions the effect of the hyperacidity upon the patient is to induce that patient to believe that there is gas in the stomach. In order to get rid of the fictitious gas, which is really nothing but the sensation caused by excessive acid, the patient makes numerous endeavors to belch, and in the course of time may swallow sufficient air to make it possible to get a little back. It is positively known that these belchers do not have great masses of gas in the stomach and that in every instance where they are given barium and buttermilk and a fluoroscopic examination made, there is found only a small bubble of gas in the fundus of the stomach, the so-called "Magenblase."

He calls attention to the fact that the patient complained of intense constipation for three and a half years, which raises the presumption of the

presence of gastric or duodenal ulcer as against the presence of biliary tract infection.

Another important point is the possibility of the presence of both gastric and duodenal ulcer in the same patient. When the ulcer of the duodenum develops first, the symptomatology consists chiefly of pain to the right of the epigastrium associated with tenderness in the duodenal area. The pain comes on one to two hours after meals and is relieved by the taking of food. When in the presence of such an ulcer of the duodenum a gastric ulcer develops, the symptomatology of the gastric ulcer immediately comes to the front and completely disguises the symptomatology of the duodenal ulcer. The pain of the gastric ulcer comes on immediately after meals and runs over, merges into, and becomes continuous with the pain of the duodenal ulcer, coming on one to two hours after meals.

On the other hand, if the gastric ulcer is first to develop and the duodenal ulcer develops subsequently, there is no means of making a double diagnosis. In such a case the only possible way of discovering the presence of a duodenal ulcer is by the X-ray examination of the duodenal cap.

He says that this double diagnosis of gastric and duodenal ulcer must always be borne in mind in any given case, because the association is a common occurrence. When the gastric ulcer is added to duodenal ulcer, the diagnosis is easily made. On the contrary, when duodenal ulcer is added to gastric ulcer, no suspicion of it will enter the examiner's mind except such suspicion as may be aroused by the fluoroscopic examination or the roentgenograms.

As to the method of treatment, Mix recommends operation. Medical treatment has been of no avail. A gastrojejunostomy will give the ulcer a chance to heal while food is passing the new way from the stomach into the jejunum.

Andrews in performing the operation follows the usual technique for stomach cases. Examination revealed a hard, scirrhous cicatrix 4 cm. below the pyloric ring. It was 1 by 1½ cm. in size and not at the pylorus, so that the symptoms of obstruction must have been due to reflex spasm of the pyloric sphincter brought about by the irritation of that ulcer floor when the acid gastric juice flowed over it. The gall-bladder and pancreas were negative. Andrews says it is the type of ulcer of the first portion of the duodenum which is often hopeless without surgery. He made a posterior gastrojejunostomy with a no-loop, occluding the pylorus by simple ligation. He calls attention to the various methods of occluding the pylorus.

He says that a certain amount of the sudden relief obtained from gastro-enterostomy is due partly to the regurgitation of bile and pancreatic fluid, as shown by Patterson. The result of that improvement is that the duodenum or even the stomach wall is relieved of irritation and the ulcer heals slowly. The ulcer heals and the stoma functionates for a while, but eventually the pylorus opens up again and then the stoma decreases much in size or may



even close entirely. Why this occurs is difficult to say. When the pylorus is occluded, however, the artificial stoma does not close and the ulcer area is permanently protected from the old irritation.

G. W. HOCHREIN.

**Palmer, D. W.: Duodenal Fistulae.** *J. Am. M. Ass.*, 1918, lxx, 595.

The author comments on the scarcity of literature on this subject, and believes that duodenal fistula occurs much more frequently than references in literature would indicate. Several authors are quoted, each giving a very gloomy prognosis, especially in cases treated expectantly.

Duodenal fistulae constitute a distinct class because of: (a) marked rapid inanition; (b) very rapid dehydration; (c) subsequent specific toxic action; (d) digestion of tissue by secretions; (e) varied nature of secretions, making them hard to control; (f) liability of marked hæmorrhage on account of digestion; (g) occurrence of fat necrosis; (h) possibility of peritonitis due to digestion of adhesions; (i) the amount of discharge, which is out of all proportion to the size of the opening.

The treatment may be either direct or indirect, surgical or expectant. The author's cases were both treated expectantly, so that surgical treatment is not discussed. The objects of treatment are: (a) protection of the skin and tract from digestion; (b) maintenance of nutrition and sufficient fluids; (c) limitation, neutralization, and dilution of secretions.

Low melting paraffin is a good skin protector if the surface can be dried sufficiently so that it will adhere; if not, zinc oxide lanolin is to be used. A solution of pure gum rubber in benzine also makes a good protection.

For the tract the injection of liquid paraffin or zinc oxide lanolin helps and petrolatum by mouth protects the tract from within. Nutrition is best maintained by rectal injections of glucose and soda with tincture of opium as a sedative.

Foods should be those exciting as little secretive action as possible, such as milk, oils, etc. Atropin and epinephrin tend to limit secretion, and the gastric acidity should be controlled by alkalies.

Irrigation of the tract by weak alkaline drip is beneficial if the overflow does not add to the skin digestion.

The author's first case followed eight days after resection of the stomach for cancer. Skin digestion was rapid. Food was cut off; atropin and sodium fluoride were given by mouth, and 2 per cent sodium fluoride was used as a wet dressing and injected along the tract. Paraffin was used as a skin protection. The discharge of bile and pancreatic fluid ceased after eight days, and the wound healed six days later.

The second case followed six days after a difficult operation for removal of stone in the ampulla of Vater. Foods were stopped by mouth, and glucose and soda bicarbonate rectal feedings were given.

Large doses of soda bicarbonate and atropin were given by mouth, sodium fluoride, one grain, by mouth, and irrigation with 1 per cent sodium fluoride showed no results after four days. Paraffin was only partially successful as a protective. On the twelfth day continuous drip irrigation was begun and continued until excoriation of the back caused its discontinuance. On the eighteenth day belladonna and epinephrin were given every two hours by mouth, the glucose solution continued, and the tract was plugged to its depth with sterile 5 per cent zinc oxide. Large doses of petrolatum were given, and on the twenty-eighth day the fistula had closed.

H. J. VAN DEN BERG.

**Sluss, J. W.: Tuberculosis of the Cæcum.** *J. Indiana St. M. Ass.*, 1918, xi, 99.

The author characterizes the stages of tuberculosis of the cæcum as: (1) the ulcerative stage; (2) hyperplasia; (3) cicatrization.

Two cases are cited which represent clinically two distinct stages of tubercular disease of the cæcum. Diagnosis of either tuberculosis or carcinoma was made on a Bulgarian, aged thirty, with symptoms of appendicitis. Operation revealed a knobby tumor studded with tubercles, involving the cæcum, ileum and colon just beyond the tumor mass. The appendix was practically normal. The tumor mass was lifted out of its bed by an incision in the parietal peritoneum along the outer border of the cæcum and ascending colon. The ileocolic and colica dextra arteries were ligated close to their origin; the ileum was sectioned well beyond the lesion, its stump inverted; and the mesentery containing the lymphatic glands was removed by a V-shaped section. The denuded area was covered over with the great omentum and the opening closed with drainage leading down to the emptied space. Pulmonary tuberculosis lighted up later, causing the patient's death.

Operation on a young woman of a tubercular family revealed an enlarged appendix, and a thickened, tubercular studded cæcum. The patient recovered from the operation but pulmonary tuberculosis with added abdominal symptoms caused death later. Ileocæcal tuberculosis in the great majority of cases is primary as far as can be determined.

The affection occasionally may begin in the mesenteric glands and may follow the lymph-channels inversely to the cæcum, fasten to its peritoneal coat and eventually reach the mucosa. The ileocæcal mucosa is a region of least resistance to bacteria because of the presence of Peyer's patches, of diminished peristalsis, and a degree of stasis, and changes in the reaction of the intestinal content. Bacterial activities easily produce ulceration areas which become the site of great proliferation of tissue in the later processes of disease. These areas gradually become organized so that marked hyperplasia supervenes. In the terminal stage inflammatory tissue tends to contract



and distort. Thus in the ulcerative stage, pain and febrile attacks may be expected. In the hyperplastic stage, the symptoms are irregular disturbances of intestinal function, and in the final stage, intestinal obstruction may mask the other clinical features.

From the ages of twenty to forty is the period when ileocaecal tuberculosis is most apt to occur. The sexes are affected about equally. A certain class of foreign laborers are most susceptible because of the kind of food eaten.

Ileocaecal tuberculosis may be diagnosed as acute appendicitis or tuberculous peritonitis in its earlier stages; later, as appendicitis with inflammatory exudates or abscess formation; and in its terminal stage as carcinoma. Many cases are wrongly diagnosed or overlooked. Chronic appendicitis, tubercular peritoneal adhesions, pelvic disease, ileocaecal tuberculosis and actinomycosis have similar symptoms at certain stages. Carcinoma rarely occurs before the age of forty. The duration is eight to nine months, while the tubercular condition is two to three years.

The pathology is ulceration of the mucosa, hyperplasia of all layers and especially the peritoneal covering; terminal cicatrization with stenosis. The tumor mass is not usually adherent. Treatment is excision if undertaken before metastasis and obstruction intervene. Before a tumor has formed, treatment applicable to pulmonary tuberculosis, with the addition of special attention to intestinal antisepsis, is wholly rational. Opening the abdomen in peritoneal tuberculosis is often sufficient to effect a cure. F. P. HAMMOND.

**Wessel, C.: Remarks on Appendicitis.** *Nord. med. Ark.*, Stockholm, 1918, 1, Kirurgi, No. 19.

Wessel reports on 300 cases of appendectomy in the Bispebjerg Hospital, Copenhagen, during the last few years. Of these patients 274 have been discharged, and 26 have died, a mortality of 8.66 per cent. Operation was undertaken in the first stage in 242 cases; 214 were operated upon in the acute stage and in these the mortality was 11.2 per cent.

With regard to the pathogenesis of appendicitis, Wessel says that while it must be considered absolutely improbable that the caecal contents under normal circumstances can fill the appendix, yet when the caecum is subject to hyperperistalsis from any cause, intrusion of its contents, including bacteria, into the appendix is possible and probable. Such a state of caecal hyperperistalsis may occur in obstipation due to intestinal toxins, etc. Appendicitis is of enterogenous origin. Inflammation of the appendix can be caused by bacteria as well as by toxic albumins or by both together.

The treatment of peritonitis is still a mooted question. The author's hospital experience has shown him that a sterile peritonitis is likely to be found during the first twelve hours, however extensive the peritonitis may be and notwithstanding its serous or suppurative character. In his hospital

he undertakes primary suture in all cases where there is no peritonitis or where this is only serous or very slightly suppurative. W. A. BRENNAN.

**Verbrycke, J. R., Jr.: Two Cases of Phlegmonous Colitis.** *Wash. M. Ann.*, 1918, xvii, 122.

The first case was a girl seventeen years of age who had had typhoid fever when four years old. She was constipated and six months previously had rectal dilatation, at which time the rectum was pinched in the blades of the speculum. Immediately afterward, she began passing blood, which condition gradually grew worse; she passed bloody mucus and had six to fourteen loose movements daily. Later each movement was followed by pain in the stomach and vomiting. She was anæmic but well built.

The urine showed a trace of albumin and several hyaline casts. The stomach contents were practically normal. Leucocytes were 23,000 to 30,000. Temperature 99 to 102 degrees. Proctoscopic examination showed intense congestion with ulceration and offensive sloughing material. The latter gave a pure culture of staphylococci.

With local treatment and autogenous vaccine for ten days, the bloody and mucous stool stopped, but the vomiting and general condition gradually grew worse. There developed abdominal tenderness and rigidity. Radiographs showed a thickened colonic wall throughout. An appendicostomy was performed and the colonic wall noted to be half an inch thick, with a phlegmonous hardness and blood-red congestion of the peritoneal coats. Examination of pus discharged each day showed a pure culture of colon bacilli and proteus. The patient died the fourth day after operation from paralytic ileus.

The second patient was a woman seventy years of age, who had always had trouble with the bowels and had had several milder attacks similar to the present one. She ran a low typhoid-like temperature. The Widal test was negative and the leucocyte count 20,000. Vomiting had occurred several times and she had six to eight bowel movements daily.

Examination was negative except for a general abdominal rigidity; the tenderness was slight and general. Proctoscopic examination showed intense congestion of the mucosa without ulceration. Radiographs showed spasticity of the caecum. No operation was performed. The case ran a protracted course of several months with final recovery. The author thinks this case was identical with the first case. CARL R. STEINKE.

**Bevan, A. D.: Benign Stricture of the Rectum; Treatment by Dilatation Under Anæsthesia and Transplantation of Mucous Membrane.** *Surg. Clin. Chicago*, 1918, ii, 67.

The patient's chief complaint was symptoms of intestinal toxæmia because of failure to have regular and complete bowel movements. Examination before operation showed the stricture to be only two inches in length.



The plan of treatment was to dilate the rectum very fully and widely and then free the mucous membrane of the dilated rectum above the point of stricture for an inch or more, bringing it down and uniting it to the margin of the anus. It is not necessary to remove the black linen sutures which are used, as they will come away themselves in eight or ten days. He suggests passing a rectal speculum gently into the anus and dilating it moderately every two or three days during the closing days of wound healing.

He reports an admirable result in his case. He adds that these rectal cases should not be lost sight of, but should be kept under careful observation for a considerable period and moderate gentle dilatation with the speculum carried out to insure against subsequent stricture. G. W. HOCHREIN.

**Bodkin, M. L.: The Varieties of Stricture of the Rectum.** *Am. J. Surg.*, 1918, xxxii, 62.

Stricture is most frequently found in the rectum, as compared with other outlets of the body. Causes for rectal stricture are classified as follows:

Malignant disease, congenital defects, traumas (operations), venereal disease, catarrhal inflammations, tuberculosis, ulcerations, spasm of the sphincters, hypertrophy of Houston's valves, pressure from adjacent organs or tumors, and acute inflammations.

Constipation, obstipation and fecal impaction with or without blood or mucus in the stools are the chief symptoms. The point where the levator ani muscle encircles the rectum and within  $3\frac{1}{2}$  inches from the anus are the most frequent sites.

Cancerous stricture which has not undergone apparent ulceration is a firm, inelastic, epithelial growth; inflammatory stricture supplies a history of disease in or about the rectum before the formation of stricture and may be accompanied by constitutional disturbances. Sarcoma assumes the rounded ball-like shape usually and is formed from the underlying connective tissue stroma; syphilitic stricture is a proliferating process without band-like characteristics of the cancer; and tuberculous stricture does not constrict the rectum because it breaks down almost as rapidly as it is formed. Ulceration of the rectum due to kidney, heart, lung, and venereal diseases, as well as simple catarrhal or specific inflammations, may cause stricture. Acute suppurative inflammations of the uterus or its adnexa, severe cellulitis or peritonitis in this region may cause the condition.

Operative procedures where surgeons remove too much redundant tissue cause stricture of the anal opening when the subsequent contractions occur after operation. F. P. HAMMOND.

**Hanes, G. S.: Inflammatory Rectosigmoidal Strictures Hitherto Undescribed.** *Interst. M. J.*, 1918, xxv, 39.

The type of stricture observed by the author in eight cases is characterized by the following points:

1. It always involves the rectosigmoidal juncture.
  2. Very soft and friable wart-like eminences or excrescences grow out from the surfaces of the strictures. They vary from one-fourth to one-half of an inch in length, are found along the entire length of the stricture, and rarely tend to pedunculation.
  3. They have an extraordinary tendency to bleed when subjected to any kind of manipulation.
  4. There is a characteristic grayish-white deposit, resembling diphtheritic membrane, all along the strictured surface.
  5. The patients have an annoying diarrhoea.
  6. The strictured portion may involve four or five inches of the gut or it may extend up into the sigmoid eight to ten inches.
  7. The thickened condition of the wall of the gut is quite uniform and is due to the increase of the connective tissue elements and also a thickening of submucous and intermuscular coats. The author feels convinced that a definite type of germ life is responsible for the pathology.
  8. The local symptoms are constriction of the lumen of the bowel, numerous wart-like growths, accumulation of a moderate amount of mucus, leucocytes, bacteria, epithelial cells, etc., with but little microscopic blood. There is an annoying sensation in the rectum which causes a constant desire to strain. Large hæmorrhoids are not infrequent complications. From the constant diarrhoea present, pain, loss of sleep, interference with digestion, etc., the patients become thin, nervous, anæmic, emaciated, and die from exhaustion.
- Colostomies have been done in 3 of the 8 cases, while in the remaining cases the small tumors were destroyed by fulguration. E. B. FREILICH.

#### LIVER, PANCREAS, AND SPLEEN

**Amster, J. L.: Wandering Dropsical Gall-Bladder.** *N. Y. M. J.*, 1918, cvii, 244.

Amster states that a review of the literature tends to convince him that wandering dropsical gall-bladder is not of exceptionally rare occurrence. The diagnosis, however, may be very difficult, as the condition may be mistaken for floating kidney, ovarian cyst, etc.

Hydrops of the gall-bladder may be due to obstruction from within or without the cystic duct. Chronic inflammation of the gall-bladder and its ducts most often causes occlusion of the cystic duct with permanent hydrops. A stone or many stones impacted in the cystic duct may produce the same condition. A dropsical gall-bladder may become more and more distended until it occupies almost the entire abdominal cavity.

The author reports the case of a woman aged fifty, from whom he removed a very large dropsical gall-bladder, measuring 6 by 9 inches in circumference and weighing 10 ounces, by the evisceration method of Tilton. In this case there was a very large stone impacted in the neck of the gall-bladder,



evidently the cause of the tremendous distention. There were also several smaller stones in the common duct. This patient had had symptoms referable to the gall-bladder for years, the most constant one of which was jaundice, which inevitably cleared up following each attack of colic.

The diagnosis in this case was based upon the following:

1. History of repeated attacks of biliary colic.
2. A tumor in the gall-bladder region which could not be far displaced from its original position.
3. Movement of the tumor with inspiration and expiration.
4. The globular and fluctuating character of the tumor.
5. Tenderness to pressure over the tumor mass.
6. The distinct separation of the tumor mass from the palpable loose kidney and lack of connection with any of the pelvic organs.

HARVEY B. MATTHEWS.

**Legueu, F.: Anaerobic Bladder Gangrene** (Les gangrènes vésicales par anaérobies). *J. d'uro.*, Par., 1918, vii, 105.

Legueu refers to gangrenous cystitis characterized by the production of detached necrotic casts of the bladder wall. They are observed especially in women during pregnancy, but they also occur in men. He reports the full details of such a case in a man of twenty-one years. The patient was a soldier who, after an operation for extraction of projectiles lodged in the upper part of the thigh and pelvis, showed retention of urine. Attempts at catheterization created a false passage followed by urethrorrhagia. The catheter was passed and the urine evacuated for some days, but the bladder became infected. Urination continued under great difficulties for some weeks and the man was operated upon.

On incision of the bladder a large quantity of purulent fluid and pus escaped. Within the edges of the incision a large mass appeared covered with concretions, with a foul odor. This was thought to be a portion of gangrenous omentum which had herniated through a rupture in the bladder wall. The mass however was found to be detached and the bladder wall intact. It was removed. The operation was ended by inserting a cystostomy tube without suturing the bladder to the abdominal wall, and placing a dressing. The recovery was uneventful, but urinary disturbances have persisted.

The piece removed was an enormous sac apparently molded on the internal face of the distended bladder. The inner surface appeared to consist of mucous membrane and the exterior surface of muscular tissue. Microscopically it was composed of thickened sclerous connective tissue and degenerated muscle fibers.

Careful bacteriologic examination of the urine was made about the time of operation and showed three types of anaerobic microbes.

In the etiology of this condition, distention of the

bladder and retention have previously been considered as fundamental conditions. But retention is in fact only a secondary circumstance. Legueu thinks that the etiology is to be sought in the anaerobic microbes which have found access to the bladder. Unfortunately in the previously reported cases either the bacteriological examination was omitted or if made, no particular attention was paid to anaerobic microbes. In the present case the presence of Jungano's bacillus was clearly demonstrated.

Diagnosis of such cases is difficult. The signs which raise suspicion are the dilated bladder, its high position and the fetid urine. In females there may be spontaneous expulsion of the membranes; this is impossible in man.

W. A. BRENNAN.

**Reimann, S. P., and Magoun, J. A. H.: Cholesterol Content of the Blood in Gall-Stone Disease.** *Surg., Gynec. & Obst.*, 1918, xxvi, 282.

To determine the presence or absence of hypercholesterinemia in cholelithiasis, and its value as a diagnostic point, the authors recorded cholesterol determinations in the blood of 60 patients with histories relating to upper abdominal lesions, and correlated their subsequent operative findings.

Normal values by the original Autenrieth-Funk method have been expressed, ranging from 130 to 190 milligrams per 100 ccm. of blood. Bloor's method gives readings from 7 to 30 per cent higher. Two hundred milligrams of cholesterol per 100 ccm. of blood was adopted as the upper limit of normal. Blood for test purposes was collected in the mornings after the patients had slept in the hospital at least over night.

From the figures collected, higher cholesterol readings were found in cases of right upper abdominal disease other than cholelithiasis. Four hundred and forty-seven milligrams per 100 ccm. of blood was the highest cholesterol reading obtained in the series in a case of carcinoma of the head of the pancreas. The lowest was 111 milligrams per 100 ccm. found in the case of chronic cholecystitis with stones. For 10 jaundiced patients with obstruction of the common duct from stones or carcinoma of the head of the pancreas, 276 milligrams per 100 ccm. of blood was the average cholesterol reading.

Age increases the cholesterol in the body fat. Patients over forty years of age showed a higher cholesterol value than those under forty. Those of the younger patients without stones showed higher quantities than those with stones, and vice versa in the older patients. Robertson and Burnett, through the discovery that the growth of malignant tumors transplanted in mice is hastened by the injection of cholesterol, have expressed the opinion that the prevalence of tumors as age advances is due to an increase of cholesterol.

The average cholesterol reading was 259 milligrams among the 60 patients having, not including gall-stones, carcinomata of the stomach, gall-bladder, œsophagus, appendix, and pancreas,



hypernephroma of the kidneys, myoma uteri, and papillomata of the gall-bladder. The average was 231 milligrams, excluding the jaundiced cases. Fourteen of 28 cases with stones showed a content above 200 milligrams, or about 63 per cent; in 38 cases without stones, 26, or about 68 per cent, showed a content below 200 milligrams.

As a result of the experiment, the authors found that many conditions may affect the quantity of cholesterol in the blood. Hypercholesterinæmia is not constantly present in cholesterol in the blood. Hypercholesterinæmia is not constantly present in cholelithiasis and it has no significance in the differential diagnosis.

F. P. HAMMOND.

**Buchanan, J. J.: Bile Peritonitis Without Evident Perforation of the Biliary Tract.** *Surg., Gynec. & Obst.*, 1918, xxvi, 303.

The author reviews the history of cases in which bile has been found in the peritoneal cavity without evidence of perforation of the bile tract. He reports one case and tabulates sixteen others. He comes to the conclusion that the condition results from such diverse conditions that no definite disease picture exists.

The author's case was a boy of twelve years, who had had typhoid at two and one-half years; at eight he began to have severe attacks of cramp-like pain in the right upper quadrant, with vomiting of bile and tenderness in the gall-bladder region. When seen he was taken with colic accompanied by vomiting, slow pulse, and slight elevation of temperature. The pain and tenderness was confined to the right side. In forty-eight hours the patient was still vomiting, had a distended and rigid abdomen, and a rapid pulse.

On opening the abdomen a fluid seemingly half bile and half sero-pus gushed from the wound. The intestines were injected, the ascending colon thickened, the appendix red but not more than the rest of the intestines, the peritoneum over the mesocolon and common duct was edematous, glassy, and green. The wall of the common duct was black and gangrenous. The gall-bladder was tense, red, and full of dark bile and muco-pus. The common, hepatic, and cystic ducts were not obstructed. No perforation was found in the bile tract, stomach, or duodenum. The gall-bladder was excised, the common duct drained, and the peritoneal cavity mopped out and closed except for the above mentioned drainage. The patient recovered with a fistula which closed in six months, and he has remained well.

The author then cites several cases to show that the peritoneum is very little affected by non-infected bile, but if infected, the bile causes a peritonitis. In discussing the tabulated cases, it is pointed out that the effusions were not tested chemically for bile, but that the physical appearances were such that the surgeons felt justified in assuming it to be bile.

The bile tract was the seat of inflammatory or

carcinomatous lesions or stones in thirteen of the sixteen cases, two followed trauma, and in one typhoid ulceration was probably present.

As to the cause, filtration through the gall-bladder wall is mentioned, and earlier in the paper some experiments by Clairmont and Von Haberer are quoted in which the common duct was ligated. In four of these cases bile effusion was found without perforation. Microscopic perforation is mentioned but is considered improbable, but a very small macroscopic opening is considered a possibility and one case is quoted in which such a cause was demonstrated. The rupture of subserous intrahepatic bile canals may also be a cause, as was demonstrated in two cases by Nauwerck.

The author suggests postperitoneal perforation with distant rupture into the peritoneal cavity, and quotes a case in which the bile passed up back of the diaphragm between the pleura and ribs, down back of the ascending colon into the pelvis and then along the sigmoid and descending colon.

The author believes that drainage of the common duct after the peritoneum has been dried offers the best chance for recovery.

H. J. VAN DEN BERG.

**Eason, J.: Remarks on Acquired Acholuric Jaundice.** *Edinb. M. J.*, 1918, xx, 158.

The history of a case of acquired acholuric jaundice or hæmolytic icterus is reported in detail. It was possible to exclude Hodgkin's disease, sarcoma, heart disease, syphilitic enlargement of the spleen and liver, malaria and kala-azar. Obstructive jaundice was excluded because the stools were of normal color and the urine contained no bile pigment.

The congenital and acquired forms of this disease possess the following in common: anæmia, diminished resistance of red cells, evidence of increased blood destruction, splenic enlargement, jaundice due to bilirubinæmia, acholuria, urobilinuria; no drowsiness, pruritus or bradycardia.

If the patient does not improve under proper climatic and hygienic conditions, splenectomy is advised. The author does not state how much benefit may be expected from splenectomy.

LISTER TUHOLSKE.

**Ozaki, Y.: Phagocytosis of Bacteria in the Excised Spleen After Perfusion with Locke's Solution.** *J. Med. Research*, 1917, xxxvii, 247.

The author draws attention to the fact that the phagocytosis of bacteria by fixed tissue cells has been but little investigated in comparison to that by the leucocytes, so that knowledge of the real mechanism of this phenomenon is still restricted. The principal reason for this, he states, is the difficulty of obtaining actively phagocytic cells from tissues in any form proper for *in vitro* tests.

In order to solve the questions involved he chose as the test object the spleen of the dog. It is well known, he states, that polymorphonuclear leucocytes, in spite of various kinds of treatment, such



as repeated washing, admixture with heterologous serum, etc., show their active vitality for a considerable time after they are removed from the host. And, as there are in the spleen two different types of cells, viz., leucocytes and fixed cells, he considered that it would be easy to follow the phagocytosis carried out by each of these elements under exactly the same conditions in each individual test.

Ozaki carried out a series of experiments, the results of which he has recorded in this study. The spleen of the dog he found could be fairly well preserved in an active condition for some time after its removal from the living body by means of careful perfusion with Locke's solution at body temperature. Wandering cells as well as fixed tissue cells showed, if at all, but slight necrobiotic changes, and their function was well carried out in so far as their bacterial ingestion was concerned.

In the spleen of the living animal as well as in that kept alive by means of Locke's solution the bacteria injected into the parenchyma were practically ingested by splenic cells and polymorphonuclear leucocytes, and to some extent also by endothelial lining cells and endothelial leucocytes.

In the living animal the grade of phagocytosis by the polymorphonuclear leucocytes found in the spleen was on an average far more pronounced than that by splenic cells. A similar relation was also observed, although somewhat less marked, within the spleen tissue kept alive by means of Locke's solution, provided that these cells did not undergo any, even slight, necrobiosis.

In one of his experiments, where the bacteria were injected after four hours from the beginning of perfusion, a marked phagocytosis took place in some of the splenic cells and in a few endothelial lining cells. The finding was so much the more striking, as the phagocytic activity of these cells was higher than that of splenic cells of the living animal. The real reason or significance was not apparent to the author, and he considers that the experiments should be repeated under varying conditions.

The present work showed the possibility of marked phagocytosis by adult fixed tissue cells outside the living body. From this it was also anticipated that a marked phagocytosis *in vitro* by fixed cells for the study of immunology would not be impossible if splenic cells were made use of.

GEORGE E. BEILBY.

### MISCELLANEOUS

Deaver, J. B.: *The Acute Abdomen. Med. Rec.*, 1918, xciii, 47.

The most common type of acute perforation into the abdominal cavity is that of the appendix, the initial symptoms of which, however, do not differ greatly from those of an uncomplicated acute attack of appendicitis. Indicative of a perforated appendix are persistence and exacerbations of the pain and tenderness in the right iliac fossa, followed by an

extension of tenderness to adjacent areas, increase of pulse-rate and of muscular rigidity, the latter being perhaps the most significant; finally the typical features of a peritonitis occur. Within the first twenty-four to forty-eight hours the operative mortality in perforating appendicitis is about 1 per cent, but it rises rapidly unless seen at this period and immediately operated upon.

Immediate operation is best in cases of appendiceal peritonitis of less than forty hours' duration. After this it is best to delay operation until the patient's condition warrants it. The appendix should be removed except when a circumscribed abscess presents the risk of spreading septic material. Remove the pus gently. Tubes are best for drainage and a glass tube through the incision or a stab wound in the pelvis is essential.

Perforating chronic gastric or duodenal ulcer is the next most common cause of acute surgical abdomen. It is characterized by pain of an intense stabbing character referred to the upper abdomen, which soon assumes a board-like rigidity. Very often the downward course of the infection toward the right iliac fossa causes extreme rigidity and is very suggestive of appendicitis. Collapse does not appear for the first hour or two, the abdomen at this stage being retracted, not distended, rigid and exquisitely tender, especially to the right of the median line above the umbilicus. Later the pulse rises, the abdomen becomes distended, tenderness becomes more marked and the symptoms of shock are accompanied by collapse. As a rule, after the first onset of pain the patient vomits, but only once. The temperature now falls and the pulse-rate increases. The previous history is very important and if this were always clear and obtainable, diagnosis would be simplified. The symptom complex of acute perforation of a gastric and a duodenal ulcer is very similar; if presented by an anæmic female, it is probably the former, and if by an adult male, usually the latter.

Every case operated upon within the first twenty-four to thirty hours should get well. After closing the perforation primary gastro-enterostomy is a good thing in skillful hands.

Acute perforating or gangrenous cholecystitis is characterized by pain which may be dull, aching, severe and continuous, with acute exacerbations, or paroxysmal as in typical gall-stone colic. It usually appears in the epigastrium, but soon localizes in the right hypochondrium. Sometimes it is referred to the right shoulder-blade and very frequently to the right iliac fossa, suggesting appendicitis, with which in fact it is often associated. Nausea and vomiting are always present and in the more severe cases tenderness and muscular rigidity is marked. Jaundice is absent as long as the common and hepatic ducts remain patulous.

The most vital point in the treatment of acute gall-bladder conditions is to operate before the toxæmia is too marked. Cholecystectomy is the operation of choice.



Acute pancreatitis may be ultra-acute, acute and subacute, the former being rapidly fatal. The acute type presents a slightly better prognosis and if the early toxæmia is survived, improvement gradually occurs and operation may be successful. The subacute type is the most common and the symptoms of pain, nausea and vomiting are less severe, causing often the diagnosis of acute indigestion to be made. The pulse and temperature are not always affected. Operation in the ultra-acute type may imperatively be immediate, but it is best if possible to wait a while to allow the body to overcome the toxins somewhat. The transperitoneal route is preferable to the extraperitoneal route as it offers free exposure of the operative field, opportunity for radical surgery and for establishment of adequate drainage. Free longitudinal incisions should be made in the pancreas and sufficient gauze and tube drainage instituted, lessening the chances of adhesions by using an enveloping sheet of rubber dam. Pelvic drainage and an antidiabetic diet are valuable.

About one-fourth of the cases of acute abdominal pain exclusive of intussusception are due to intestinal obstruction, and early diagnosis and operation affords a very favorable prognosis. The symptoms are similar to perforation of a hollow viscus except that vomiting is more persistent and continuous, the pain is more susceptible to palpation than to percussion, rigidity is absent, relaxation of the abdomen occurring between pain intervals. Abdominal friction will frequently excite peristalsis emptying the lower bowel, there being, however, complete obstruction of the upper bowel. Restlessness is quite noticeable.

The common causes of this condition are fibrous bands constricting the bowel or beneath which a loop of bowel becomes strangulated, kinking of the bowel by adhesions, strangulation of an internal hernia, sudden impaction of a gall-stone in the small intestine, sudden twist of the bowel, sudden stricture

of the small intestine or colon. Operation, when done early enough, usually results satisfactorily. The Fowler position and Murphy method of enteroclysis are invaluable in pre-operative treatment. Ice bags also are of value in relieving pain and lessening peristalsis.

H. H. FRELICH.

**Seguinot: A Study of 47 Abdominal Wounds Treated in a Division Ambulance** (Étude sur 47 plaies de l'abdomen traitées dans une ambulance divisionnaire). *Bull. et mém. Soc. de chir. de Par.*, 1918, xliv, 111.

Of 47 abdominal wounds observed by Seguinot, 46 were operated upon. Twenty cases were treated during a lull, and 26 cases during active fighting. The cases were laparotomized and the lesions treated.

The following results were obtained: Of the 20 cases treated in a calm period, 13 presented univisceral lesions, giving 4 deaths and 9 recoveries; 7 presented multivisceral lesions, giving 4 deaths and 3 recoveries.

Of the 26 cases treated during a period of active fighting, 12 non-operated cases gave 12 deaths; 14 operated cases gave 9 deaths; 2 cases were evacuated; there were 3 recoveries.

The results in the first group show that 50 per cent of small intestine wound cases recover even when complicated with other lesions. In these cases it should be remarked that the patients were received for treatment within three hours after injury.

The 75 per cent mortality in the second group of cases is due, according to Seguinot, to the distance of the ambulance from the front line, to the necessary, rapid, and frequent evacuations, to insufficient skilled assistance and indifferent equipment, all of these factors being more or less due to the condition of fighting and the overcrowding of the ambulances.

W. A. BRENNAN.

## SURGERY OF THE EXTREMITIES

### DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS, CONDITIONS COMMONLY FOUND IN THE EXTREMITIES

**Day, H. F.: Observations on Disabled Shoulders.** *Boston M. & S. J.*, 1918, clxxviii, 389.

This article gives a differential diagnosis of most of the common injuries to the shoulder-joint and deals particularly with the discussion of the etiology, treatment and prognosis of subacromial bursitis.

The author has based his study on cases seen in private and hospital practice, and in the article gives a tabular view of 64 subacromial bursitis cases in the out-door department of the Peter Bent Brigham Hospital.

He has divided the disease into three types, the acute, subacute and chronic. In the acute stage he

says that pain is the outstanding complaint and is accompanied by limited abduction. In the subacute, limited motion due to adhesions is the main diagnostic point; and in the chronic type, the adhesions having generally broken up, abduction is again possible but often painful, due to roughening of the bursa.

As to treatment, briefly he advises bed treatment for the first few days with the arm held in abduction and external rotation, aspirin being given to control pain. In the subacute type, he suggests, first, gradual stretching; second, repeated forcible breaking up of adhesions; and third, an operation which he describes. In the chronic cases he considers that patience combined with exercises, baking, and massage are necessary.

In conclusion he says, "Subacromial bursitis is a

definite demonstrable disease and has certain characteristic symptoms. Its prognosis is ultimately good. Its cure can be hastened by proper treatment."

**Juaristi, D. V.: The Abscesses of Pott's Disease** (Los abscesos del mal de Pott). *Prog. de los clín.*, Madrid, 1918, vi, 5.

In a well illustrated and lengthy article Juaristi considers the anatomical and clinical aspects of the various types of abscess associated with Pott's disease. The treatment preferred is absolute rest with protection of the infected region and evacuation of the abscess. The evacuation should always be by puncture, never by incision, a fine trocar being used with an aspirator.

Various liquids and pastes are injected into the abscess cavities according to indications. These are principally composed of camphorated naphthol with glycerine, iodoform, ether, creosote, guaiacol, etc. The formulæ and indications are given. Iodoform ether should generally not be injected except in small residual abscesses, as it causes strong distention of the walls and may occasion rupture.

A detailed study of various regional abscesses is given.

W. A. BRENNAN.

**Feldman, M. H.: Possible Relationship of an Oral Focus to Chronic Osteomyelitis.** *Dental Cosmos*, 1918, lx, 147.

Scientific investigations to determine the exact relationship existing between systemic disorders and oral foci seem to be resulting in the collection of no small amount of evidence which tends to lay responsibility for many ills at the door of the oral cavity.

The author reports the case of a male aged thirty-six who, twenty-one years prior to his admission to the dental operating room, had had an osteomyelitis in his right femur of such severity that the leg was amputated at the hip-joint. During the years following, the patient had more than thirty operations on various parts of his body. Osteomyelitis had been found in the left leg, elbows, arms and inferior mandible. Radiograms of the teeth were made and six lower incisors were extracted. The author believes that these teeth had been the focus of infection for more than twenty years.

P. H. KREUSCHER.

**Waterhouse, H. F.: The Treatment of Tuberculous Disease of the Larger Joints and of the Spine.** *Practitioner*, Lond., 1918, c, 8.

Early treatment means early diagnosis. Make the diagnosis before destructive and degenerative changes have occurred. The author has great faith in Koch's new tuberculin as an adjunct to treatment. This he uses as a routine in doses from 1:20,000 mg. to 1:1,000 mg. graduated for twelve weekly injections. Those cases which withstand the drug well may be given more, even to 1:250 mg.

Bier's hyperæmic treatment is also employed in every case of joint tuberculosis below the upper arm and below the thigh.

A 10 per cent emulsion of iodoform and glycerine is used to stimulate fibrosis and encapsulation of the tuberculous focus.

Tuberculosis of the hip is essentially a disease of childhood. The destructive process brings about an absorption of the head of the femur and the acetabulum with displacement of the neck backward.

The first indication in treatment is rest. Then apply weight extension to the limb in an abducted position in order to relieve muscular spasm and pain, and to keep the softened bony ends separate. After all pain, tenderness and muscle spasm have ceased, ambulatory treatment with a Thomas hip splint is employed.

Tuberculosis of the knee usually begins in the synovial membrane. A bony focus exists in almost every case in children. The focus occurs as frequently in the tibia as in the femur. A diffuse infiltration and thickening of the synovia commonly takes place. The knee tends to be flexed. The tibia may be displaced backward on the femur by the hamstrings, and rotated outward by the biceps.

The treatment in children is non-operative because of their power of resistance, and in order to avoid any disturbance of growth in the epiphyses. In adults operative treatment is indicated even with resulting ankylosis, because resistance is poor. Weight extension is used in knee tuberculosis.

In the ankle the synovia is usually involved. Fix the foot at right angles and keep it immobilized.

If the shoulder-joint is involved in adults, keep the arm slightly abducted, the elbow flexed and the thumb up.

The characteristic deformity in tuberculosis of the elbow is partial flexion of the forearm at an angle of 130°, and the arm pronated. To correct it, fix the forearm in such a position that it makes with the arm an angle less than a right angle and have the hand semipronated.

The primary point of attack in the wrist is the synovia. The hands and fingers are flexed and a bulbous swelling appears at the wrist. Dorsiflexion is the position for correct treatment.

In the spine, tuberculosis begins as an osteomyelitis in the anterior part of the bodies of one or two vertebrae. In adults the process is a periosteitis. Abscess complicates spinal tuberculosis more than it does tuberculosis of any other joint. Never introduce a drainage tube into such an abscess, for secondary infection always occurs. Paraplegia not infrequently is found. This is always motor and due to an extradural tuberculous granulation tissue. Treatment is absolute rest in a recumbent position. After all pain, spasm and tenderness have ceased, a jacket of plaster of Paris or leather is used.

JOHN MITCHELL.

**Ridlon, J.: Difficulties in the Diagnosis of Hip Disease; a Case of Osteo-Arthritis.** *Surg. Clin. Chicago*, 1918, ii, 223.

The difficulty in diagnosing some cases of hip disease is well brought out in Ridlon's article. He



cites a case of osteo-arthritis which has many of the ear-marks of a tuberculosis, but without corroborating X-ray findings.

The patient, an unmarried woman of thirty-four, was run over by a light wagon at the age of twelve. She soon recovered and remained well for five years. At the age of seventeen on turning over in a sleeping berth, something happened to the right hip and she was unable to walk. From this she soon fully recovered. Five years later she developed periods of lameness in the right leg and pain in the right knee. In 1906 she became so lame that she took baths for rheumatism. In May, 1907, she had recurrence of the lameness and in July was put to bed with extension. After getting up she wore a brace and walked on crutches for five years. During 1913 she had extension for three months and a plaster cast for twenty-three weeks. Then she considered herself practically well. Later she had a fall and the hip became so bad that she was unable to walk. She had a temperature, and an abscess was feared. A cast was again applied. At the time the case was reported she complained that the limb was sore all the time and that there was pain. She had some indigestion. She had one bad tooth that ached whenever the hip ached.

Examination showed the right leg three-fourths of an inch shorter than the left, but no deformity at the hip.

The history of periodic attacks covering several years, the pain at the knee, the temperature, and the "abscess feared," strongly suggested a tuberculous hip, but the lack of atrophy of the calf and particularly the absence of flexion and adduction deformity of the hip made that diagnosis doubtful. The X-ray showed one-half an inch of erosion into the upper border of the acetabulum and at least two-thirds of the femoral head destroyed. Deposits were seen along the upper border of the neck at least one-sixteenth of an inch thick and a similar deposit extended out from the border of the acetabulum, as if the capsule had been thickened and then calcified. From the X-ray findings Ridlon believed that a diagnosis of osteo-arthritis was warranted.

G. W. HOCHREIN.

**Gill, F. L.: Gunshot Wounds of the Knee-Joint.**  
*Med. J. Austral.*, 1918, i, 102.

The diagnosis of septic arthritis of the knee is often a difficult matter, especially where there are septic wounds of other regions. The diagnosis rests upon: (1) rising temperature; (2) high pulse-rate, 120; (3) increase in the degree of distention of the joint; and (4) aspiration, which should always be done before operation.

A favorable prognosis of gunshot wounds of the knee depends upon: (1) early complete immobilization and rest; (2) the early removal of all shell fragments that lie within the joint; (3) disinfection of the septic joint by the Carrel-Dakin method, the termination being an ankylosed joint.

R. B. COFIELD.

**Perera, A.: New Methods in the Treatment of Tuberculous Osteo-Arthritis of the Knee-Joint**  
(Nuevas orientaciones en el tratamiento de las osteo-artritis tuberculosas de la rodilla). *Prog. de los clín.*, Madrid, 1918, vi, 57.

The use of immobilizing bandages is indicated only in arthritis with an acute onset, in painful arthritis, in tuberculous hydrops with notable cedema and in fungous synovitis. It is contra-indicated in abscesses and after any surgical operation. For correcting a vicious position traction and massage of the muscles is employed. Celluloid is the best material for immobilizing the joint. Plaster is one of the worst materials and the fenestrated cast is especially bad. Its indications in connection with injections or roentgenotherapy are extremely limited.

Functional rest should be rigorously insisted upon without fear of ankylosis.

Of the various substances injected into the articulations or with abscesses the author recommends only iodine associated with olive oil, glycerine or creosote. They are useful in fistulous tracts and deep abscesses; but the quantity should not exceed 40 ccm. They are contra-indicated in acute processes and when there are multiple abscesses.

Various other injection substances recommended in literature have been tried and have been proved useless or harmful.

The treatment by exposure to sunlight in clear and cold air, if the patient's state does not contra-indicate it, gives the most positive results in this disease. In 80 per cent of closed bone lesions heliotherapy however does not stop the tubercular process and in 20 per cent of the cases it aggravates it. This type calls for an open operation. Heliotherapy cures open bone lesions. In closed synovial lesions heliotherapy cures; it takes much time especially in adults and there may be cases in which it aggravates. In open synovial cases heliotherapy may cure, but it does not aggravate. In cartilaginous and multiple lesions either closed or open, heliotherapy is the only treatment that cures, whether the case is incipient or old.

With regard to operative procedures, extra-epiphyseal tuberculous foci when existing ought always to be excised. Typical resection is only a means of last resort in children; in adults it is preferable to amputation. Arthrectomy ought to be done in the beginning of a pure synovial lesion.

These remarks apply to other joints as well as to the knee.

W. A. BRENNAN.

**Desplats, R., and Buquet, A.: Obliteration of the Limb Arteries and Circulatory Nerve Disturbances; Nervous Ischæmia of the Wounded**  
(Obliteration des artères des membres et troubles circulatoires des nerfs; l'ischémie nerveuse des blessés de guerre). *Rev. de méd.*, Par., 1918, p. 578.

Vasomotor, trophic and similar disturbances in the wounded have been considered to be of nervous



origin. The great frequency of concomitant arterial wounds with other wounds of the limbs has drawn attention rather to the part played by the vascular lesion.

The authors give details of 5 severe injuries of the limb arteries. From their close study the authors conclude that such vascular wounds when they end in complete obliteration of these great trunk vessels are capable of causing paralytic, anæsthetic and trophic disturbances clearly imputable to the degeneration of the nerves at their extremity. Such disturbances more especially follow injuries of the axillary artery probably due to special anatomic conditions. They have not particularly observed such disturbances in the lower limb. They do not say that such do not occur, but they confine themselves to what they have observed. One fact has struck them, namely, that ligation of the femoral artery, which so often causes gangrene that the surgeon is obliged to amputate within a few days, rarely provokes isolated ischæmic neuritis with concomitant paralysis, anæsthesia, etc., which appears to arise from a parenchymatous degeneration of the nerve. However, there are some less noticeable nervous disturbances due to a more transitory and less complete ischæmia.

These findings instigated further investigations of the motor, sensory, and trophic effects of severe arterial lesions. The authors have therefore systematically examined all cases of wounds of the large and medium arteries which came to their service. Some typical cases are detailed.

Sensory and other disturbances are more common in the upper limb than in the lower and follow the same order as the symptoms found in ischæmia of the axillary artery except that they are much less in degree. The limb is atrophied but œdematous toward the extremity; sensory and motor disturbances are slight; the electric reactions are modified; the nerves, while they have lost their direct excitability, have not lost their conductivity; there is a tendency to finger deformity.

The reason why circulatory disturbance of the nerves does not more frequently follow obliteration of the lower limb trunk vessels the authors believe is to be found in the less elaborate collateral system in the lower limbs than in the upper.

Obliteration of the arterial trunk of the limbs is in itself sufficient to explain trophic and other disturbances, outside of any concomitant nerve lesion. In the upper limb the syndrome may be completely established when the lesion is in the dangerous zone of the axillary artery. This syndrome consists in: (1) paralysis of the ulnar, median and radial; (2) degeneration over the same territory; (3) complete anæsthesia at the finger ends; (4) characteristic finger deformity. In the lower limb the same syndrome seems to appear only theoretically in the isolated state, because it is masked by gangrene. When gangrene does not develop, the syndrome shows in an attenuated form; it is early, and rapidly vanishes.

The surgical treatment must be directed toward both arterial and nerve lesions if such are concomitant, as happens in the majority of cases.

W. A. BRENNAN.

**Delitala, F.: Partial Amputation of the Hand** (Le amputazioni parziali della mano). *Chir. d. organ. d. mov.*, Bologna, 1917, 1, 595.

The most frequent causes of partial amputation of the hand are hand grenade and bomb wounds. These form 68 per cent of 54 cases. In 14 per cent of the cases the lesion was due to an accidental explosion.

The most frequent type of mutilation is the total loss of one or more fingers, forming 42 per cent, while partial loss occurs in 20 per cent.

Carpometacarpal disarticulation occurs in 15 per cent and bilateral amputation in 8 per cent of the cases.

The author's article gives a detailed description of the plastic methods employed in treating the stump, after the usual surgical cleansing and treatment of the wound. Endeavor is made to preserve every particle of vital functioning tissue, as such can be used to good purpose in the later plastics; also the fixation of various prosthetic appliances to take the place of the missing parts. These are extensively illustrated for every type of mutilation.

W. A. BRENNAN.

#### FRACTURES AND DISLOCATIONS

**Woolsey, R. A.: Fractures of the Humerus.** *J. Missouri St. M. Ass.*, 1918, xv, 50.

Adequate fixation of the humerus is especially difficult, which accounts for the frequent cases of non-union, malunion and delayed union. Un-united fracture is often the result of surgical impatience. Even a fibrous union, given time and aided by efforts to promote calcification, will often terminate in a solid bony junction. In compound fractures have the field cleansed with 5 per cent tincture of iodine, insert a long nozzled glass syringe filled with the same solution to the bottom of the wound and expel the iodine at this point.

In all fractures of the humerus that can be properly reduced, the best fixation dressing is a crinoline cast, which, if of the proper grade, will be just as strong and many times less heavy than plaster of Paris. A splint of cigar box material cut in quarter of an inch strips and stuck to adhesive plaster in such a way as to conform to the rotundity of the limb is often of great value and should be used under the crinoline cast, being applied over sheet cotton alone. It should include the shoulder to the neck and be applied as a spiral figure eight that extends across the chest and under the opposite axilla; should include the elbow at a right angle with the forearm semiprone; should not include the wrist and hand to avoid subsequent stiffness. The entire forearm and hand should be carried in a sling.

When a fragment rides up from muscular action,



the companion fragment must be so adjusted as to correct the deformity. Overriding in oblique fractures is corrected by extension and permanent traction to the arm placed almost at right angles to the body. A simple appliance for this is described. Fractures that are impossible to reduce or retain should be plated. Non-union must be plated or autogenous bone graft used. Fixation with plates, nails or screws in fractures near or in joints is important. A crinoline cast is also used.

CARL R. STEINKE.

**Leriche, R.: Primary Subcapsular Periosteal Resection in Articular Fractures Due to Gunshot** (De la résection sous-capsulo-périostée primitive dans les fractures articulaires par pénétration de projectiles d'artillerie). *Presse méd.*, Par., 1918, xxvi, 85.

In the last session of the Interallied Surgical Congress the conclusion was reached regarding the treatment of articular fractures that primary resection is at present only exceptionally indicated; and that it should be discontinued as a method of obtaining the best functional results; the care of correcting defective functional results should be left to deferred orthopedic resections.

Leriche thinks that these conclusions cannot be accepted without discussion. He discusses at length the value of primary resection. Numerous statistics have shown that resections have generally given bad results, but according to Leriche they show merely that the proper means of doing a resection is not known or generally practiced. So-called Ollier resections are done without following his strict technique or using his precise instruments.

When a subcapsular periosteal resection is primarily done strictly according to technique, with the constant view of assuring future functioning by respecting the soft tissues and observing minute operative details, it gives in penetrating articular fractures the same functional results that the Ollier method gives in the secondary period.

The author gives the statistics of all articular lesions observed in his service received between the fourth and eighteenth hour after injury. Of 69 cases received, 3 died almost immediately from the gravity of the wounds; 5 had a primary amputation or disarticulation; 1 had a secondary amputation. There were 22 arthrotomies and 37 typical resections. If the immediate deaths and primary amputations be deducted, there were 61 articular lesions giving an immediate operative indication in which there has been no death and only 1 failure. The 37 resections gave 98 per cent successes.

Leriche's service deals only with evident fracture cases. During the period in which his 69 cases were treated, 24 articular soft part injuries were treated in the same surgical unit, 23 being arthrotomies, and 1 resection. Combining both statistics, Leriche finds that of all articular wounds received in his surgical unit, 5 to 6 per cent were amputated, 52 per cent were arthrotomized and 48 per cent were

resected. These figures therefore refute the assertion that resection is only exceptionally indicated at the present time. In free penetrating articular fractures not complicated by severe neighboring lesions, resection only failed once. In the foot, especially in severe tarsal injuries, resection has conservative indications.

The field for subcapsular periosteal primary resection ought not to be restricted, as it can materially reduce the number of primary and secondary amputations. In order to obtain exact ideas as to the treatment of articular fractures, statistics of certain procedures should not be relied on but only the total results, including primary deaths and amputations.

W. A. BRENNAN.

**Faulds, A. G., and Teacher, J. H.: A Most Unusual Case of Pathological Fracture; Myeloid Sarcoma and Cystic Disease of the Bone.** *Glasgow M. J.*, 1917, lxxxix, 17.

The authors report an unusual case of pathological fracture of the femur occurring in a woman of thirty. Three months before her admission to the hospital, as she was going down stairs, "her leg went under her." It was found that she had a fracture of the femur at about the junction of the upper and middle thirds. A splint was applied but at the end of three months union had not taken place.

X-ray examination indicated that disease had been the cause of the fracture. The patient was operated upon with the object of removing a piece of bone and surrounding tissue for diagnosis by the pathologist. The bone and surrounding tissue were of a yellow-greenish hue and the bone was abnormally soft. Based on the clinical findings, amputation of the limb at the hip was performed.

The patient improved and was dismissed when the stump had healed, some seven weeks later, complaining, however, of pain in the other thigh. The pathological report revealed cavities in the neck of the femur with thin bony walls. The cyst practically stopped at the epiphyseal line, the actual head presenting a fairly normal appearance. There were cavities in the lower fragment of the neck and in the shaft down to the fracture. There was no apparent tumor. In the tibia there were two areas which yielded under the finger. They were covered by periosteum and were of dark color. No abnormal areas were found in the other bones. Portions of soft tissue were taken from various parts of the femur, all of which proved to be red marrow, except one small brown mass which was found to be myeloid sarcoma.

E. B. FREILICH.

## SURGERY OF THE BONES, JOINTS, ETC.

**Ceccarelli, G.: Post-Traumatic Ankylosis of the Elbow and Its Surgical Treatment** (Anchilosi post-traumatiche del gomito e loro trattamento chirurgico). *Riforma med.*, Napoli, 1917, xxxiii, 1173.

The author gives the details of a case of post-traumatic ankylosis of the elbow-joint in a girl of



sixteen years. The forearm was completely fixed on the arm in incomplete extension at an angle of 120 degrees in a position intermediate between supination and pronation.

The osseo-fibrous growths were removed and strips of fascia lata removed from the middle third of the thigh and interposed accurately over the radial stump and fixed with a few catgut stitches.

After fifty days the patient left the hospital showing perfect flexion; extension was 165° and there was almost normal pronation and supination. After a long period, the elbow preserves its normal conditions.

The author thinks that fascia lata strips fulfil the three important functions which any interposed material should furnish, namely, to prevent the resected surfaces again coming into fusion by contact; to obviate osteogenesis of the resected ends; and to diminish the very sharp pains occurring shortly after intervention when active or passive movements of the joints are made.

W. A. BRENNAN.

**Jean, G.: Late Articular Resections** (Résections articulaires tardives). *Lyon chirurg.*, 1917, xiv, 1055.

The author gives short histories of more than 60 cases of late resections on all the large joints.

Shoulder-joint resection almost always gives good results with sufficient mobility.

For the elbow-joint the author recommends Ollier's subperiosteal resection, following it as typically as possible. The postoperative treatment demands special care. The surgeon himself should personally see to the dressings, immobilization, and passive and active movements, to obtain a perfect functional result with a mobile joint.

Resection of the wrist-joint gives only slight mobility.

Resection of the hip is always very serious and the author's cases have given an 80 per cent mortality. He prefers an anterior incision because it preserves the insertion of the pelvi-trochanteric muscles.

Fractures of the knee are always dangerous and the author recommends immediate amputation: (1) in old and discharging fractures with fever and a bad general state; (2) when the length of the injury exceeds 10 cm.; (3) when the principal injury is tibial. Resection is recommended when the general state permits; abstention with general curettage and heliotherapy is recommended for cases with ankylosis and fistula.

Resection in the ankle-joint, astraglectomy without removal of the malleolus, gives satisfactory results.

Partial amputation of the foot seems preferable to the author for severely infected fractures of the tarsal bones with large defects in soft parts, whereas in old fractures with a fistula, curettage alone often brings about complete recovery.

W. A. BRENNAN.

## ORTHOPEDICS IN GENERAL

**Walker, J. B., and Cody, C. C.: Organization of a Hospital for the Treatment of Fractures.** *South. M. J.*, 1918, xi, 242.

The first hospital adapted to the special treatment of fractures is now being organized with one thousand beds. The hospital will be built on the unit pavilion basis, thoroughly supplied with modern equipment, and located somewhere in France. To this hospital it is intended to move the more serious cases of fracture of the bones of the extremities, especially those of the femur and humerus. In the organization of this hospital it is proposed to have the personnel composed of skilled surgeons who have devoted particular attention to the treatment of fractures.

In working out the plans for a special fracture hospital, attention has not been confined merely to the buildings and methods to be pursued therein; but the problem has been taken up from the beginning. No treatment for fractures can be satisfactory which ignores the methods pursued before the wounded soldier enters the hospital. The treatment must be so systematized that the soldier will be under one method from the time he is injured until he leaves the hospital. This is the only rational procedure, and haphazard methods can only result in inevitable disappointment.

In order to make this plan effective, two things must be accomplished: first, the adoption of a standard method of treatment; and second, training each surgeon in the use of the standard appliances, and giving him a definite realization of the part he is to play in the treatment of fractures. The latter is the more formidable of the two, and is already in the process of accomplishment by the establishment of intensive courses of instruction in standard methods for the treatment of fractures.

The purpose of this course of instruction is to familiarize medical officers with standard methods in the treatment of fractures. It is intended that officers so trained will not only serve in the special fracture hospital but in field, base, and general hospitals, and also serve as regimental officers, so that a continuity in the methods for treating fractures can be maintained. By this means it is proposed to establish team work on the part of medical officers throughout the army in order that the wounded soldier will receive promptly the most efficient treatment, whether at the regimental aid station, the dressing station, the field hospital, the evacuating hospital, or the base hospital, as well as along the lines of transportation.

The logical results of this co-operation will be to secure early recovery, lessen deformity, and reduce to a minimum the number of soldiers permanently disabled. It is realized that the exigencies of the service in the zone of the advance will frequently be such as to render the standard methods impracticable, but by indicating clearly the desideratum it is hoped that the difficulties in the field will act less



as an obstacle than as a stimulus to the ingenuity of the medical officers.

Nearly all war fractures are compound, so that any treatment which considers merely the fracture and not the wound and the soldier would be quite ineffective. Consequently, the course of instruction will be initiated with a brief but thorough presentation of wounds from a military standpoint, their causes and their treatment. This will be followed by the course in standard methods for treating fractures proper. The instruction will be intensely practical in nature, consisting in the demonstration of the splints, their adaptability and application.

The instructors, who are all eminent surgeons, have been supplied with an outline of the course to be presented so that uniformity of instruction is assured. It is intended that the medical officers on the completion of the course will return to their several camps and thus become a focus of information on the standard methods for the treatment of fractures. In this way, the practical methods of technique will be very rapidly disseminated among the medical officers.

Such a paper is manifestly inadequate for the proper presentation of the splints which have been adopted as standard, or for a detailed discussion of their points of superiority; but suffice it to say that they have proven their value under the conditions that this country will be called upon shortly to face.

Too much emphasis cannot be placed upon early and adequate surgery in the treatment for fractures. Only the shortest possible time should be allowed to elapse from the time the fracture occurs until adequate extension, reduction, and wound antiseptics is inaugurated in order to protect the integrity of the muscle, lessen the nerve trauma and the pain, and promote early healing. The simple statement of the proposition is so self-evident that it is the proof. Consequently, it is insisted that standard methods be inaugurated just as close to the firing lines as is practicable, and that they be maintained along the lines of transportation in order that the patient reach the hospital in the very best possible condition. The advantages of such an organization for the special treatment of fractures is quite evident from a military, economic, and surgical standpoint.

E. C. ROBITSEK.

**Royle, N. D.: The Neuromuscular Re-Education of the Soldier.** *Med. J. Austral.*, 1917, ii, 453.

The pathological lesions or rather the conditions affecting the neuromuscular organization of the soldier may be purely psychic. Shell shock is a common cause. For instance, a bullet wound through the shoulder region without injury to the brachial plexus may lead to a total loss of function of the upper limb. The type of paralysis may be of the flaccid or the spastic type.

The pathological process may be anatomical, as (a) gunshot wounds of the cerebral cortex and spinal cord; (b) disease or injury to the peripheral nerves; (3) muscle injury and infection, including ischæmia;

(4) arthritic conditions such as ankylosis leading to a severe type of paresis.

The treatment of these conditions is psychophysical on one hand and mechanical on the other. Massage, baths, and manipulation of the joints must be systematically carried out. Electricity is of doubtful value, except in the psychical cases. Here the high frequency is of much value especially when the patient sees the violet ray of the glass electrodes that are being used on him. Nerve and muscle re-education are of the utmost importance and great benefit is derived therefrom.

Nutrition of the muscles must be maintained and this is best obtained by the whirlpool baths, followed by systematic massage. The Swedish system of exercise is a valuable adjunct. Last but not least, the persons giving the massage and other passive exercise must have a high degree of skill, together with a thorough knowledge of the anatomy and physiology of the part.

J. J. KURLANDER.

**Parker, C. A.: Non-Operative Clinic Illustrating Therapeutic Measures Employed in a Variety of Orthopedic Conditions.** *Surg. Clin. Chicago*, 1918, ii, 213.

Parker presents thirteen cases, including one of cerebral spastic paralysis, four of infantile paralysis, three of knee-joint tuberculosis, one each of tuberculosis of the os calcis, congenital club-foot, epiphysitis, leg ulcer, and scoliosis.

These cases represent various stages of disease and the effects of various methods of treatment.

In the infantile paralysis cases he brings out the point that ambulatory braces should not be applied until the limbs are placed in the proper position with the knees extended and feet at right angles to the legs and that lack of attention to this particular is responsible for much disappointment in the use of braces.

In the tuberculous knee cases he calls attention to the orthopedic rule that a cast should never be removed from an inflamed joint until one is ready to immediately apply another. Neglect of this rule is responsible for much misery in joint surgery. In this connection he also warns against allowing a patient with a flexed and inflamed knee to step upon the injured limb, even if the knee is in a cast.

In conclusion he shows two photographs illustrating the result in a case of an extensive burn of the neck treated by adhesive plaster strips and an apparatus to prevent contractures. The original condition and method of treatment was reported in the June number of the *Surgical Clinics*. He says that most of the scar is as soft and pliable as normal skin, though there are numerous small ridges of scar tissue.

G. W. HOCHREIN.

**Mayer, L.: The Application of the Physiological Principle to Tendon Transplantations.** *Am. J. Surg.*, 1918, xxxii, 1.

To secure the best results from tendon transplantation the author sought to answer two questions

namely: "How do tendons glide?" and "What is their tension?"

By studying the anatomy of the tendon and its sheath, the author answered the first query. The sheath acted as a fluid buffer so situated as to lessen friction. Only such tendons as changed their direction were provided with a sheath. The achillis had no sheath, but was surrounded with areolar tissue which permitted motion. The sheath was a synovial lined cavity containing serous fluid. Within the sheath was a loose areolar tissue, the mesotenon, continuous with the paratenon without the sheath. A delicate fold of loose connective tissue from without the sheath was continuous with the mesotenon within. This served to shut off the sheath cavity. From the mesotenon the tendon derived its vascular supply.

From this study the author formulated these rules:

1. Use the sheath of the paralyzed tendon as a pathway for transplanted tendon. Thus a physiological environment is established for the tendon.

2. Supply the tendon with an investment of loose gliding tissue. For example, in substituting the peroneus longus for the tibialis anticus, one meets the fascia separating the two muscle planes. To perforate the fascia would give rise to adhesions. The deep surface of the fascia which is coated with areolar tissue can be used for the pathway of the peroneus and thus avoid adhesions.

3. Begin early function of the tendon. The trauma of operation gives rise to adhesions. No danger of separating the tendon from its new insertion arises if the tendon is buried beneath the periosteum of the bone.

Experimentation gave the explanation of the second question. The tension of a tendon was found, by actual scale measurement, to be zero when the origin of the muscle and the point of its insertion were brought as near to each other as possible, that is, in a position of maximum muscular relaxation. Therefore to suture a tendon under normal tension the limb must be held in such a position that the origin of the muscle whose tendon is to be transplanted and the new point of insertion are approximated as nearly as possible. For example, in substituting the peroneus longus for the tibialis anticus, the foot should be dorsiflexed, adducted and supinated.

By following up his experiments in operative work, the author was able to secure good results. The normal freedom of the tendon was assured and the unparalyzed muscle accurately assumed the function of the paralyzed.

JOHN MITCHELL.

**McCarthy, E. A.: The After-Care of the War Cripples.** *Boston M. & S. J.*, 1918, clxxviii, 37.

Orthopedic surgery has done much toward a change of viewpoint in handling war cripples. In the past wars it was the practice, if a man was discharged as totally or partially unfit for further service, to give him a pension and allow him to shift for himself.

The enormity of the present conflict is such that this attitude by any nation toward its disabled soldiers would be an economic catastrophe.

It has been the plan by those in authority in the Medical Department in this country to pursue a course similar to that inaugurated in Great Britain by Sir Robert Jones, i.e., the establishment of reconstruction hospitals and curative workshops in different centers in the United States where orthopedic and other treatment can be instituted, and manual training carried out.

Knowledge gained in the treatment of war cripples will greatly improve the present methods in caring for the industrial cripple. R. B. COFIELD.

**Hughes, M. O.: Some of the Limitations of Military Orthopedic Surgery.** *Med. J. Austral.*, 1917, ii, 451.

In performing late nerve suture, latent sepsis is often lighted up and the results are failures. Pus cavities have been found in the long bones three months after the wounds have healed. Severe scar formation renders operation more difficult and interferes with rapid clean repair.

In seven cases of arthroplasty for bony ankylosis of the elbow, the results were good in six. The results in nine cases of arthroplasty of the finger were good in eight cases. There was an excellent result in a case of ankylosis of the lower jaw, a flap of temporal fascia being interposed. There were three cases of bone grafting for defects of the mandible, tibia and radius, a successful result being obtained in the radius only. Adherent scars to muscle were relieved either by excision or by the interposition of a flap of fascia lata. Fascia lata is quite resistant to infection, and has also been used to repair a gap of 7.5 cm. in a flexor tendon.

In operating on nerves for paralysis, the results were brilliant when the condition was due to pressure of a bullet. Results were also good in freeing a nerve from a callus or scar. In a series of eighteen cases of nerve suture the results were not very encouraging. If the general results are failures, the author thinks it best to resort to tendon transplantation.

J. J. KURLANDER.

## SURGERY OF THE SPINAL COLUMN AND CORD

**Mayer, L.: A Method of Draining the Bodies of the Vertebrae; Preliminary Report.** *J. Am. M. Ass.*, 1918, lxx, 593.

Symptoms suggestive of osteomyelitis of the spine in a case of sepsis due to infection by the

streptococcus viridans led Mayer to work out a technique by means of which the bodies of the vertebrae may be rendered accessible to surgical intervention where necessity requires. Though the patient in question recovered before Mayer had an opportunity



to try his technique, nevertheless he has worked out a method on the cadaver which appears to be very satisfactory.

To approach the body of the vertebra an oblique route will have to be followed, which will enable the operator not only to bring his instrument to bear on the body of the vertebra, but also to see it accurately. This he accomplishes by the following technique, the essential part of which consists in the upward retraction of a wide muscular flap.

Assuming that the first and second lumbar vertebrae are diseased, a six-inch longitudinal incision is made a little to the left of the midline, and at the outer border of the iliocostalis muscle a second longitudinal incision corresponding to the first is also made. These are joined at their mid-point by a transverse incision. The skin flaps are dissected upward and downward, exposing the thick mass of the spinal muscles, that is to say, the multifidus spinæ, semispinalis dorsi, iliocostalis and longissimus dorsi.

To prevent hæmorrhage, a hæmostatic suture is now inserted, beginning at the upper outer angle of the wound, running down to the lower angle, across to the spine and upward along the spinous processes. The suture must be taken sufficiently deep to reach the middle layer of the lumbar fascia on the outer side, and the lamina on the spinal side. Corresponding to this suture, a muscle flap is outlined with its base upward, and the entire muscular mass thus freed is drawn toward the head of the patient with strong retractors. This exposes the laminæ and transverse processes of the vertebrae in question; and the corresponding portion of the middle layer of the lumbar fascia.

It is a simple matter now to resect the transverse processes at their base. Working from the outer angle of the wound, the operator's finger can readily free the psoas from the body of the vertebrae. Then, by using an appropriately shaped instrument, he can retract the psoas and the quadratus lumborum so that he can see the body of the vertebra and with a long burr bore a hole into it and follow up this procedure with a curette. At this level the nerves are of comparatively little significance. However, they can be found and injury avoided if the operator is careful.

After suitable drainage has been instituted, the wound is closed by bringing the muscle flap down into position, suturing it in place and suturing the skin at all points except those at which the drainage tubes emerge.

In the dorsal region the technique is somewhat more difficult because of the ribs, but it is comparatively simple to resect the rib in addition to the transverse process.

G. W. HOCHREIN.

**Richardson, E. H.:** *The Interpretation of Lumbosacral Backache in Women.* *South. M. J.*, 1918, xi, 139.

Backache is not merely a complaint to be vaguely associated with neurasthenia, but indicates the

definite existence of a specific pathological condition which materially discounts the efficiency of the individual.

To determine the etiology of lumbosacral backache in women, a careful study is necessary, both from the standpoint of an orthopedic surgeon and of the gynecologist.

The orthopedic surgeon should make a careful study of the lower spine, the lumbosacral and sacro-iliac articulations for evidences of arthritis, of injury, and of chronic strain from various causes such as bony abnormalities, unequal length of the lower extremities, faulty attitudes, etc.

Whatever the nature of the particular gynecological disorder found, it produces lumbosacral backache only through the strain incident upon the faulty posture which the individual has gradually assumed in order to minimize the pelvic discomfort.

No matter how skilfully the operative therapy may be executed, it will often fail utterly to relieve the backache unless supplemented by orthopedic measures which will restore normal balance.

R. B. COFIELD.

**Lance, M.:** *Experimental Study of the Methods of Forbes and Abbott in the Treatment of Severe Scoliosis* (Étude expérimentale des manœuvres de Forbes et d'Abbott dans le traitement des scolioses graves). *Rev. d'orthop.*, Par., 1918, p. 405.

The author has made a number of experimental studies on normal and scoliotic children to test the value of the methods of Forbes and Abbott for the correction of severe scoliosis.

The author distinguishes the following movements of the vertebral column: anteroposterior movements, lateral movements, movements of torsion on a fixed point, and movements of torsion between two fixed points. This is Abbott's classification; but he calls "torsion" movement on one fixed point and "rotation" movement between two fixed points. Lance thinks that the term torsion should be restricted to movements impressed on the vertebral column, and rotation to the result of this torsion on the vertebral body.

Forbes' method is a torsion of the vertebral column on one fixed point, not made directly on the vertebrae but indirectly by the intermediary of the ribs. The result is a rotation of the vertebrae inversely from the motion compressed on the axis of the shoulders. Forbes explains the vertebral rotation action in that "the power of creating torsion by the medium of the arm seems to be transmitted to the thorax by the intermediary of the serratus magnus and the synergic muscles." Lance thinks this hypothesis is difficult to establish, as the movement of the ribs around the costal angle is not demonstrated and it is difficult to understand how the costal angle is transformed into a fixed point; moreover the serratus magnus is not the only muscle on which the traction of the arm acts. The posterior scapular muscles, the rhomboid, the grand

dorsal, and the trapezius are as much involved as the serratus magnus and their action tends to turn the vertebral body the opposite way.

Regarding the Forbes method of fixing the pelvis and turning the shoulders, causing torsion of the vertebral column, Lance's experiments show him that it is possible by rotation and inclination of the pelvis to act on the lumbar and dorsolumbar region alone. He has successfully employed this method since February, 1914, in treatment of lumbar scoliosis.

Abbott's method according to Lance may be divided into a series of actions on the vertebral column. These are: (1) an action on the shoulders similar to that of the Forbes method. It is a torsion of the column on a fixed point, but the fixed point, instead of being pelvic as in the Forbes method, is

thoracic; (2) an action on the pelvis which results in rotation of the lumbar vertebrae in the same sense as the pelvis; (3) a thoracic torsion of the column between two fixed points; (4) a derotation action by the special Abbott sling; (5) a powerful sidewise action by the lateral traction bands.

The author believes that it is wrong to say that the methods of Forbes and Abbott are in opposition and that their modes of action are contrary. Both methods give varied modes of torsion of the vertebral column. The Abbott method utilizes all these principles, but the action of some naturally lessen the effect of others. Both place a series of modes at the disposal of the orthopedist and it is for him to adapt and combine them for each particular case.

The results of experiments are given and accompanied by radiographs. W. A. BRENNAN.

## SURGERY OF THE NERVOUS SYSTEM

**Strauss, I.:** *The Treatment of Sciatica.* *J. Am. M. Ass.*, 1917, lxi, 2033.

The author has studied and analyzed 91 cases of sciatica. He believes that there exists a large group of cases in which the lesion, functional or organic, exists in the nerve itself. This opinion originally obtained, but recently many men have swung to the extreme view that all sciatica is but a symptom. In his cases the author could exclude definite organic lesions elsewhere.

He gives the pathology, describes the symptomatology and clinical course, and outlines with care and detail the management of sciatica and its treatment by perineurial and epidural space injections of physiologic salt solution. K. L. VEHE.

**Coriat, I. H.:** *The Presence of Taste Fibers in the Lingual Nerve.* *Dental Cosmos*, 1918, lx, 217.

Coriat observed that in 21 children between the ages of ten and sixteen years the presence of taste fibers in the lingual nerve was demonstrated. This was done by injections with local anæsthesia. Seven of these were left mandibular injections, six right mandibular injections, and eight double mandibular injections. In all these cases, on the anterior two-thirds of the tongue, either on the right or left side or on both sides, according to the nature of the mandibular injections, there was a complete loss of sensation to touch, pain, and temperature.

In every case likewise there was a complete loss of taste for sweet, sour, and salty objects over the area of the tongue where the other sensations were lacking. In each case, fifteen minutes were allowed to elapse in order that the local anæsthetic might reach its full point of intensity. In some of the observations, the anterior two-thirds of the tongue would sometimes show only a diminished sensation for touch and pain, while in this same area taste would be completely lost.

Observations such as these demonstrated that the

taste fibers become blocked before the fibers for touch and pain, first, because the former are more highly differentiated, and second, because the lingual nerve must contain taste fibers; otherwise no diminution of taste sensation would have taken place over the distribution of the lingual nerve. This is in harmony with the author's observations on selective sensory regeneration, in which it was demonstrated that the fibers for light touch are regenerated later than the fibers for pain, because they are more highly specialized and differentiated. In none of the cases was taste or sensation disturbed on the posterior portion of the tongue.

In one experiment the subject was able to distinguish salt slightly, but unable to perceive sweet. This was probably due to the persistence of special neurons which subserve the function of tasting salt. There was temporary blocking of the "sweet" peripheral receptors, a sort of selective apparatus for different taste qualities, the same as the selective sensory apparatus in the skin. Frankl-Hochwart has also pointed out that there may be selective receptors for different taste qualities on the tongue, an observation that is confirmed by one of the experiments.

To summarize, as the result of isolated mandibular injections with novocaine for the extraction of teeth, which is in the nature of an exact physiological experiment, it was found that the fibers for taste in the anterior portion of the tongue pass through the lingual nerve, at least in its peripheral portion, before they join the chorda tympani.

M. N. FEDERSPIEL.

**Sicard, J. A.:** *Painful Neuritis Resulting from Wounds of War; Treatment by Intertruncular Alcoholization of the Nerves.* *Lancet*, Lond., 1918, cxciv, 213.

Paroxysmal neuralgias are present more often in certain nerves than in others, notably the median



sciatic, and more rarely, the ulnar, the crural, with the radial occasionally. In certain cases the painful condition persists, resisting all treatment, those of the median particularly having an irritable condition similar to that of trigeminal neuralgia.

The author relates his experiences in treatment of such obstinate cases, medically and surgically, and refers to the failure to give relief until intratruncular alcoholization was employed.

This method applies only to cases in which pain is restricted to the tributary peripheral nervous territory of the injured nerve. Technique is described in detail, the nerve involved being exposed under local or general anaesthesia, and one to two cubic centimeters of alcohol at 60 to 80 per cent injected at from 3 to 4 cm. above the seat of injury.

For success of this method, the injection must be made 3 to 4 cm. above the nerve lesion; all nerve

trunks supplying the painful region must be injected; if there has been former surgical intervention, injection must be above the superior limit of the former operation.

The method is used only in the extreme cases.

Alcohol at 70 degrees interrupts the motor conductivity but for six to ten months, recuperation of function then occurring, since this method does not cause wallerian degeneration.

Certain cases show increased motor function immediately after injection, due possibly to greater affinity of the sensory fibers to alcohol or to the fact that excess of pain may have formerly caused inhibition of motor function.

The method is recommended in resistant cases of painful neuritis caused by gunshot wounds; and special attention is called to permanent cures effected and to the return of motor power after sensory relief.

V. E. DUDMAN.

## MISCELLANEOUS

### CLINICAL ENTITIES—TUMORS, ULCERS, ABSCESES, ETC.

**Jack, W. R., and Teacher, J. H.: A Case of Metastatic Cancer of the Bone-Marrow Without Erythroblastic Reaction.** *Glasgow M. J.*, 1918, vii, 81.

The authors refer to the blood picture generally accepted as being characteristic of carcinoma. This is of the chlorotic type, having a low color index and no erythroblasts, as contrasted with the picture presented when bony metastasis occurs, in which case the high color index and myelæmia, coupled with bone pains, are the chief ground for belief that such progress of pathology has occurred.

They cite a case, however, as an exception to this rule. This case gave a history suggestive of gastric carcinoma, substantiated on operation. Relief was obtained by gastro-enterostomy. After one year, emaciation and loss of weight was marked, and bone pains, sternal and vertebral, suggested bone metastasis. Blood count revealed a chlorotic type of anæmia, no erythroblastic reaction being present.

Autopsy showed a primary pyloric carcinoma, with secondary tumors in the left lung, liver, sternum, ribs, and vertebræ.

In comparing this case with former reported cases of like character in which active erythroblastic reaction was present, the authors suggest that the regenerative effort may have been less because of a smaller amount of tumor tissue in the marrow.

Another possible explanation for the lack of reaction is that some cases may be non-reactive because of their greater toxicity, analogy being drawn to the relatively shorter course of the non-reactive aplastic anæmias as compared with the relatively less toxic pernicious anæmias, in which regeneration presents for a time.

Whatever may be the explanation, the authors conclude that the blood picture in bone metastases of carcinoma, while suggestive and substantiatory, is not a necessary diagnostic feature.

V. E. DUDMAN.

**Cannon, W. B., Fraser, J., and Hooper, A. N.: Some Alterations in Distribution and Character of Blood in Shock and Hæmorrhage.** *J. Am. M. Ass.*, 1918, lxx, 526.

The authors report their observations in 98 cases of shock and hæmorrhage with 14 control cases. The patients were severely wounded soldiers at a casualty clearing station. The observers made routine examinations of the blood, consisting of red blood corpuscle counts, estimation of the hæmoglobin, and determination of the percentage of corpuscles in the blood. The examinations were made on capillary and venous blood. The capillary red count was found high in shock, i.e., six to seven million, much higher in proportion than the venous. The discrepancy is greater, the more profound the shock. There is evidently concentration and a stagnation of corpuscles in the capillaries. This condition is gradually recovered from in two or three days.

The capillary hæmoglobin readings exceeded the venous by amounts ranging from 6 to 29 per cent. When hæmorrhage accompanies shock, the capillary red count may be low, but bears the same higher relation to the venous. In hæmorrhage cases the red count is usually much lower than in shock alone but is not as low as the pallid appearance of the patient would indicate. In 21 such cases the average count was from 5,800,000 to 3,900,000. The venous was much lower. There was always a relatively low hæmoglobin reading, followed by a further fall in the count and hæmoglobin. After

operation attended by hæmorrhage the same condition of low hæmoglobin as compared with the red count was present. If there was no hæmorrhage the hæmoglobin and corpuscles might be higher than before operation, probably owing to loss of fluid from the body.

Both the count and hæmoglobin are raised by transfusion of blood. Injection of gum solution leads to a dilution of the blood that may persist for some hours. Intravenous administration of a large amount (2 pints) of hypertonic salt solution may markedly reduce the hæmoglobin content of the blood; half that amount has not had this effect and is safer. Injection of the salt solution reduces the capillary stasis.

As a prognostic sign, continued concentration of the capillary blood for several days is an unfavorable condition. Disappearance of the concentration indicates improvement. Continued dilution of the blood after the fourth or fifth day is ominous.

L. R. GOLDSMITH.

**Polak, J. O., and Heffter, O. H.: A Clinical Study of Blood-Pressure and Hæmoglobin in Post-operative Shock, Postoperative Hæmorrhage, and Postoperative Cardiac Dilatation.** *Surg., Gynec. & Obst.*, 1918, xxvi, 312.

As a result of a careful study of the blood-pressure, hæmoglobin and leucocyte count before, during, and after operation in a series of cases, Polak and Heffter draw the following conclusions:

There is a constant rise of 5 to 15 points in the hæmoglobin readings following ether anæsthesia, when the anæsthesia lasts over thirty minutes.

In the majority of cases there is a moderate fall in both the systolic and diastolic blood-pressure following ether. The blood-pressure returns to normal, i. e., pre-operative reading, in 12 to 48 hours. In cases of shock, especially where there has been much blood loss during the operation, the fall in blood-pressure is greater than after long operation without blood loss, dropping from 10 to 50 mm.

The pulse-pressure is a better index of hæmorrhage or cardiac failure than the systolic pressure.

There is a constant rise in the leucocyte count in hæmorrhage, while the leucocytes fall in shock.

As regards operative prognosis, the systolic blood-pressure is of less consequence than the pulse-pressure. A high systolic blood-pressure is of no particular significance, providing the pulse-pressure be at least 30 mm. The only exception is the high pulse-pressure of aortic regurgitation.

LISTER TUHOLSKE.

**Madigan, J. J., and Moore, T. V.: Dystrophia Adiposogenitalis; Froehlich's Syndrome; Report of a Case.** *J. Am. M. Ass.*, 1918, lxx, 669.

The authors report the case of a boy presenting the cardinal symptoms of Froehlich's syndrome, dystrophia adiposogenitalis. Taking the case as an example, they discuss these symptoms, grouping them as follows, according to Cushing's scheme:

1. Neighborhood symptoms: deformation of the sella turcica, suggesting a hypophyseal tumor; optic atrophy and lateral nystagmus; nasopharyngeal discharge of clear watery fluid.

2. General pressure symptoms: no headache, vomiting, or choked disk.

3. Glandular symptoms: above the average height, suggesting hyperpituitary function, but possessing fine features; adiposity; maxillary prognathism, due to retarded mandibular development; polydipsia.

4. Symptoms referable to other glands: sexual aplasia, undescended testicles, well developed mammae, enlarged thyroid, bronzing of the skin, and dullness suggestive of an enlarged thymus.

Reference is made to Bartels' advancement of three theories explaining the relationship of hypophyseal changes to this class of dystrophy: (1) both tumor and dystrophy may be due to inborn co-ordinate germinal dispositions; (2) hypophyseal tumors cause the dystrophy, or (3) injury to a neighboring center, rather than to the hypophysis itself, causes the dystrophy.

Cases explained by the second theory develop later in life. The case cited is explained by the first theory, as proven by (1) the hereditary taint and number of deformities in the mother's paternal relatives; and (2) the prenatal origin of the case as shown by (a) blindness from birth; (b) nystagmus at three to four months; (c) evident prenatal genital aplasia; and (d) the small optic disks.

V. E. DUDMAN.

**Carter, W. W.: Status Lymphaticus; Death Following Tonsillectomy; Autopsy.** *Med. Rec.*, 1918, xciii, 19.

Carter reports an unusual complication following a tonsil operation. Three hours after the operation, done under general anæsthesia, the patient, a girl five years of age, suddenly became cyanosed, and death ensued before the house surgeon could be summoned.

An autopsy was performed three hours after death, with the following findings: The thymus gland weighed 21½ grams and was enlarged, reaching over the base of the heart and blood-vessels; the foramen ovale of the heart was open; the malpighian corpuscles of the spleen were unusually prominent; and the mesenteric glands were enlarged. The retroperitoneal glands were enormously enlarged. A pathological diagnosis of status lymphaticus was made.

The author has met with only two cases of this type in his large experience and states that it is impossible to foretell the existing condition.

The thymus gland has a rich arterial supply, but the veins emerging from it constitute only a single small plexus; this disproportion between the afferent and efferent blood-vessels would seem to favor rapid engorgement of the gland, and is held by some authors to be the cause of sudden death during a violent strain.



Two views have received wide attention: (1) that there is a neurosis of some sort, toxic or otherwise, and that death is a cardiac death; (2) that there is a compression of the trachea and that death is due to strangulation.

The author believes that death in his case was cardiac.

The anæsthetic and not the operation, Carter believes, is usually the important factor in determining the fatal issue. In those cases where death is due to compression there is usually a history of gradual increasing dyspnœa extending over a period of weeks or months.

In 1904 Jackson reported a case of a child four years of age in which dyspnœa was relieved by using a long tracheotomy tube; a cure was later effected by removing the thymus gland. M. A. BERNSTEIN.

**Detweiler, H. K., and Maitland, H. B.: The Localization of Streptococcus Viridans. *J. Exp. Med.*, 1918, xxvii, 37.**

The authors point out that the theory of the power of selective action on the part of bacteria, with regard to the tissues in which they may localize, is by no means a new one, and it has been known for many years that the meningococcus has a predilection for the meninges, bacillus diphtheriæ for the mucous membrane of the throat, bacillus typhosus for lymphoid tissue, the pneumococcus for the lungs, and bacillus pertussis for the tracheal mucous membrane. But the idea that different strains of the same organism should possess distinct localizing power and should vary consistently in their selective action is not generally accepted, they state.

In the work here reported strains of streptococcus viridans only were used. The plan followed was to use each culture of streptococcus immediately upon isolation. The reason for this was the claim that strains of streptococci lose their special localizing power if subcultured. In some instances the strains were used as isolated and again after several subcultures had been made. It frequently happened, however, that it was impossible for some reason to try out a strain at once; in such cases the fact was indicated in the reports.

The number of rabbits used for the first inoculation was usually three, but this also was not strictly adhered to because of circumstances which the authors could not control. The organisms were obtained from many different sources and from patients suffering from a diversity of ailments, in an endeavor to make the series as comprehensive as possible.

The strains of streptococci employed in these experiments were obtained by recognized methods of bacteriological procedure. In cases of endocarditis the technique of blood culture was that described by the authors in 1916, while in the instances in which the affected valves were cultured, the tissues were treated after the manner described by Rosenow. This was also carried out in culturing

appendices, gall-bladders, and other tissues. Cultures from the tonsils were obtained by expressing the cheesy material and other débris from the tonsillar crypts after swabbing the surface with sterile gauze. Extirpated tonsils were washed in sterile saline solution, then carefully opened, and material from the depths was cultured.

Abscesses at the apices of teeth were cultured in the dentist's office or at the dental clinic at the hospital. After swabbing the area of operation with 2 per cent iodine, the tooth was extracted with great care to prevent contamination, and cultures were taken from the apex. Sometimes the tooth was broken open and cultures of streptococcus viridans were obtained from the pulp. The technique in connection with cases of pyorrhœa alveolaris was simple and effective. Preparation of the area was carried out as described and a fine capillary pipette with bulb attached inserted between the tooth and the gum. The point was thrust to quite a depth and the bulb was not released until the point was at the bottom of the pocket. In these cases streptococcus viridans in pure culture resulted in nearly every instance.

Rabbits about eight to twelve weeks old were used and were inoculated intravenously in the marginal ear vein. The doses were large but not sufficient to cause immediate or very early death, except in a few instances. The average time elapsing between the date of inoculation and that of post-mortem examination was three to four days. Postmortem examination was performed upon the animals immediately following their death.

The lesions which the authors observed were both gross and microscopic; ulceration of the stomach, vegetations on the endocardium, turbid fluid in the joints, and hæmorrhage on the mucous and serous surfaces being typical of the former, while the latter are discussed by the authors under three types: hæmorrhage, bacterial emboli and areas of leucocytic infiltration.

The results of their experiments did not substantiate in full the theory of the power of selective action of streptococcus viridans. A few strains showed a remarkable constancy in location and type of lesion, but these strains were greatly in the minority.

The location of the lesions in animals seemed to bear no relation to the origin of the organism or to the lesions produced by it in the patient from which the strain was obtained. Streptococcus viridans, regardless of site of origin in the patient, produced most lesions in the heart and in the joints.

GEORGE E. BEILBY.

**Hirose, K.: Experiments in the Artificial Production of Amyloid. *Bull. Johns Hopkins Hosp.*, 1918, xxix, 40.**

Although the explanations of the arterial hypertension that accompanies nephritis have been very unsatisfactory, the fact that amyloid disease of the kidney has been almost always without effect upon

the blood-pressure and without an accompanying hypertrophy of the heart seemed very interesting to the author.

At the suggestions of Welch and Winternitz, he undertook a series of experiments with the object of producing amyloid artificially in the kidneys of animals, in order to determine whether or not amyloid kidneys were unassociated with high blood-pressure, and to study the effects of vasoconstrictor and vasodilator influences in such animals.

The experiments failed of their object, however, inasmuch as it was found impossible to produce amyloid by any of the methods employed. Nevertheless the publication of a brief summary of the work seemed justified to Hirose because it showed that, even when the methods described by other authors were faithfully followed over long periods, amyloid failed to appear, a fact which suggested to him that its occasional development should be regarded as either accidental or due to some factor not definitely recognized.

The experiments were carried out on goats, dogs and rabbits, and the substances injected were staphylococcus and turpentine.

No conclusions concerning the chief point of the problem were reached from the present series of experiments, since no amyloid degeneration was produced, but it was shown that the artificial production of amyloid was very difficult and inconstant, even when methods were employed which had sometimes been successful. Renal lesions were produced, but it seemed to the author that the factor responsible for the prosecution of amyloid has not as yet been recognized. GEORGE E. BEILBY.

### BLOOD

**Henry, C. K. P.:** *The Surgical Treatment of Pernicious Anæmia.* *Canad. M. Ass. J.*, 1918, viii, 115.

Treatment of pernicious anæmia must accomplish three things: (1) remove the source of infection; (2) make up for the lost blood by (a) transfusion of whole blood, (b) stimulation of the blood-forming organs; and (3) stop hæmolysis.

It has been found that the presence of the spleen in the body is not necessary to the well-being of the individual. Experimentally and from pathological and bacteriological studies splenectomy is a rational treatment for pernicious anæmia. It is indicated in patients under fifty years of age, when less than one year ill, with a relatively good blood picture, and especially where the spleen is enlarged and hæmolysis acute. Splenectomy is not to be done during an acute crisis, or in a period where the patient shows a steady decrease in hæmoglobin and red cells, or mental torpor. It should be done before spinal cord changes occur. Striking improvement occurs following operation in almost all cases. Patients with an enlarged spleen do best.

It is best to perform the operation four to ten days after transfusion, when platelets and retic-

ulated cells are increased. It is wise to transfuse 500 ccm. of whole blood on the table at the close of the operation. Where the hæmoglobin is 25 per cent or lower, preliminary blood transfusion should always be done.

The transfusion of blood is necessarily an adjunct of treatment, and in treating pernicious anæmia one must be prepared to carry out multiple transfusions. The introduction of whole blood immediately makes up for blood loss. The red cells are living and last for two to twenty-one days. There is an immediate improvement in appearance and well-being of the patient. The hæmoglobin increases 10 to 20 per cent, the red cell count goes up 500,000 to 1,000,000, and appetite and digestion improve. It stimulates the bone-marrow; nucleated red cells appear in the blood. Transfusion does not make new the worn-out organs, but helps tide over their period of repair and gives a stimulus to new growth. It prolongs the periods of remission and often initiates a remission. It increases resisting power, lowers temperature and prepares for splenectomy.

It is now generally expected that splenectomy (1) initiates in a large percentage of cases a prompt remission, lasting six months usually, rarely one year; (2) that it is the best and most lasting stimulus available for the blood-forming organs; (3) that it does more for the patient than single or repeated blood transfusions; (4) that it prolongs life.

Henry concludes as follows:

Pernicious anæmia continues to be a fatal disease. Under ordinary medical treatment the duration of life is shorter than under transfusion and splenectomy. Cases do best who come earliest under this treatment.

The treatment must be systematic and carried out by one who is able to provide suitable donors, and to carry out the necessary blood tests for obtaining these donors.

Splenectomy should be done at a suitable time, properly prepared for, and followed by transfusion from time to time.

All foci of infection must be looked for and removed. The operator must be ready to do an appendectomy and cholecystectomy at the time of operation for the removal of the spleen.

ALBERT EHRENFRIED.

**Fraser, J., and Cowell, E. M.:** *A Clinical Study of Blood-Pressure in Wound Conditions.* *J. Am. M. Ass.*, 1918, lxx, 520.

The authors have conducted investigations for a period of two years on the relationship of blood-pressure to various wound conditions. The work was done in a casualty clearing station a few miles from the front line. Of the instruments employed the mercury manometer gave the most accurate reading of the systolic pressure, while the spring instrument, though not so accurate from a mechanical point of view as the mercury column, gave a more easily appreciable reading of the diastolic pressure. Healthy soldiers were used as controls.



The average systolic pressure in a wide series of cases was 110 to 120, and the diastolic from 70 to 80, while the pulse-pressure averaged 40 mm. The systolic pressure was somewhat higher among soldiers engaged in actual fighting than among those who were occasionally exposed to fire. The raised pressure quickly dropped when the soldier was resting away from the firing line. The average systolic pressure in aeroplane pilots after a two hours' bombing raid remained constant at 135 mm.

Pressure reading taken shortly after the patient had been wounded can be classified into two distinct groups: (1) the hypertension group, in which the systolic pressure varies from 150 to 160 or even 170 mm.; (2) the hypotension group with primary shock, in which the pressure varies from 40 to 90 mm. In this first examination there were practically none showing a normal pressure. Following treatment the blood-pressure may become partially re-established.

In scalp wounds there is no appreciable alteration in the blood-pressure. Compound fracture of the skull with dura intact shows a relatively high pressure, averaging above 140 mm. Penetrating wounds of the skull with free drainage are generally associated with a low blood-pressure. In wounds of the ventricles the pressure is from 130 to 170 mm. In superficial wounds the pressure is low. Wounds of the head are accompanied by unstable blood-pressure. If at all possible operation on the head should not be undertaken until the pressure becomes stable. General anaesthesia increases the danger.

In abdominal wounds the blood-pressure was found to be low, i.e., 50 to 100 mm., in patients seen within six hours after an intraperitoneal injury of a hollow viscus. With the application of warmth, rest, and morphine the primary shock passes off and pressure rises. If sepsis or great loss of blood produces secondary shock, the pressure falls again. In perforating wounds of solid viscera the systolic reading is from 130 to 140 mm., even in cases accompanied by considerable hæmorrhage. In extraperitoneal wounds of the viscera the pressure is practically normal. Large wounds of the parietes are generally associated with a lower blood-pressure than small wounds, even if there is less visceral destruction in the former. When the peritoneal cavity is opened and blood allowed to escape, the pressure falls rapidly; if, however, the abdominal cavity does not contain much blood, its opening is followed by a rise of about 20 mm. After ten minutes there is again a slight fall.

Large open chest wounds are accompanied by a profound fall of blood-pressure. Uncomplicated closed wounds have normal pressure. Hypotension is present with severe hæmorrhage or severe exposure to cold or infection. Compound fractures of extremities are associated with low pressure, especially marked in fractures around the knee-joint. In face wounds there is no alteration, unless lowered in compound fracture of bones. Multiple

wounds of the body and extremities cause a fall in blood-pressure.

As to treatment of shock, the best results, even in the severest cases accompanied by hæmorrhage were obtained by direct blood transfusion. Injections of calcium hypertonic gum solution will produce an immediate rise of pressure in hæmorrhage cases or cases of hypotension complicated by toxæmia. This may tide the patient through an operation. Infusion with hypertonic saline is useful in milder cases of shock and hæmorrhage. Results obtained after infusion with physiologic sodium chloride solution have been unsatisfactory.

As an aid to treatment and prognosis a steadily rising or maintained high pressure is a favorable prognostic sign. Sudden fall may indicate onset of gas gangrene or sepsis.

Reports of illustrative cases with charts accompany the interesting observations.

L. R. GOLDSMITH.

**Hédon, E.: Transfusion of Citrated Blood** (Sur la transfusion du sang citraté). *Presse méd.*, Par., 1918, xxvi, 57.

Hédon gives the priority of making transfusions of citrated blood to Agote of Buenos Aires in 1914. The method was almost simultaneously practised by Lewisohn of New York and Hustin of Brussels. Hédon's own researches were made independently at the instigation of Jeanbrau.

Recent experiments on animals have shown Hédon that transfusion of citrated blood increases the coagulability of the whole blood in a transfused dog. Although the question still remains under investigation, there appears to be no danger that an injection of citrated blood will diminish a patient's coagulability and expose him to the danger of secondary hæmorrhage.

W. A. BRENNAN.

## BLOOD AND LYMPH VESSELS

**Neuhof, H.: Fascia Transplantation into Lateral Defects of the Major Arteries.** *Surg., Gynec. & Obst.*, 1918, xxvi, 324.

Neuhof proposes to demonstrate that fascia is as serviceable as vessel-wall or peritoneum-muscle for the replacement of lateral defects of the major arteries, and at the same time offers greater possibilities for application to human surgery.

In patching an arterial defect with a section of artery or vein or peritoneum-muscle, accurate apposition of intima of vessel to intima or peritoneum of transplant, avoidance of trauma to the inner lining of the transplant, use of special suture material, etc., are essential. Theoretically, a simple, strong, connective tissue such as fascia could be used without fear of damaging a delicate intima and without the necessity of accurate apposition of layers. Also the chance for the success of a fascial graft appears inherently greater than those of more highly differentiated tissues. Finally, it has been shown that defects of other hollow viscera can



be adequately replaced by fascia with regeneration of the lining membrane.

Surgical conditions involving the use of such transplants are usually emergencies encountered by the general and not the specially skilled blood-vessel surgeon. Autotransplants of segments of artery are not obtainable in human surgery. Vein grafts are more feasible, but suitable ones are obtained with some difficulty. Peritoneum-muscle transplants can be legitimately applied only to the repairing of defects of intra-abdominal vessels. Fascia, however, is accessible in the neighborhood of almost every operative wound. The fascia lata is the most desirable and it may be obtained readily and quickly in unlimited quantity.

The author performed seven experimental operations on dogs, of which four were followed from six to nine months. Except for one case which was complicated by hæmorrhage, and one with thrombosis, the results were satisfactory anatomically, functionally and histologically.

Rubber covered artery clamps shut off the artery above and below the lateral defect; branches of the artery located between the clamps are ligated or temporarily clamped. Blood in the interior of the vessel is washed away and a gauze sponge freely spread with vaseline is placed over the exposed lumen. A section of fascia lata of the desired shape and of slightly larger size is removed, dipped in vaseline and immediately placed over the arterial defect, with its smooth surface facing the lumen. It is fixed in place by four sutures, and a continuous suture approximating the edge of the fascia to the cut edge of the artery is made between them. Compressing the patch lightly with a piece of vaselined gauze, the lower and then the upper clamp on the artery is removed. If there is oozing from gaps between individual stitches, reinforcing ones are passed from the margin of the transplant to the adjoining arterial wall at those places.

ALBERT EHRENFRIED.

**Burrows, H.: Paralysis Following Arterial Injuries.**  
*Brit. M. J.*, 1918, i, 199.

Extensive paralytic phenomena may follow a vascular lesion independent of any direct traumatism of peripheral nerves. The main symptoms are subjective sensations in the distal part of the affected limbs, anæsthesia more or less of "stocking" or "glove" type, muscular paralysis, hardness of muscles, and œdema. The subjective sensations were referred to as "pins and needles." Motor paralysis was present in all of 10 illustrative cases.

In seven of the cases considered to be ischæmic in nature there was obliterative injury of the distal pulse, subjective sensation of "pins and needles," muscular paralysis and anæsthesia of the stocking or glove distribution. In three the paralysis gave the impression of being less organic and was termed reflex paralysis. In these cases there was arterial injury without complete paralysis, absence of "pins and needles" sensation, flaccid paralyses of

muscles and widespread loss of cutaneous sensibility, extending in two instances well above the level of the wound.

The electrical reactions of the affected muscles have not been studied. Prognosis and possibility of resultant deformity is not known. Until more is known about these cases one should be reluctant to tie a main vessel to stop bleeding. An attempt should be made to find a possible bleeding branch or if the injury is to the main trunk, suture should be considered. Where it is imperative to tie the artery, the vein should be tied with it.

C. A. HEDBLÖM.

## POISONS

**Wright, A. E., and Fleming, A.: Acidæmia Gas Gangrene, and the Conditions Which Favor the Growth of Its Infective Agent in the Blood Fluids.** *Lancet*, Lond., 1918, cxciv, 205.

In connection with gas gangrene one of the authors has shown that: (1) the bacillus of Welch when cultivated in serum renders that medium acid; (2) the normal blood fluids by virtue of their alkalinity and antitryptic power antagonize the growth of the bacillus; (3) the blood fluids become a more favorable culture medium for the organism when their alkalinity is blunted by acid, or their antitryptic power by trypsin, and more conspicuously when both are done; (4) the septicæmic gas infection which develops in animals is associated with the development of the postmortem acidosis; (5) in the living animal the evolution of gas gangrene goes hand in hand with a local and general acidosis; (6) in man the characteristic toxæmia of gas gangrene is correlated with the supervention of a very severe acidosis; and (7) an immediate improvement of the patient follows the intravenous injection of alkali.

In a table the authors show that in the toxæmia of gas gangrene there is a very pronounced acid intoxication. All of the gas gangrene microbes, with the possible exception of bacillus fallax, when they grow freely make the serum acid. Those of inferior rank grow with difficulty in normal serum and grow better and better as the serum alkalinity is blunted off.

There seems to be no special predisposition of wounded muscle to gas gangrene infection due to its carbohydrate content, for Hult has shown that severe muscular exercise uses up every trace of glycogen in the body; consequently in men wounded during intense fatigue of battle, it cannot be taken for granted that their muscles contain glycogen. However, functioning and devitalized muscle elaborates carbonic and lactic acid; therefore in a muscle fatigued or cut off from its blood supply by trauma, tourniquet, ligature, etc., a local reduction of alkalinity occurs which would be favorable to the development of the gas-gangrene bacillus. Experimentally glucose was added to serum; it does not exert upon the growth of the bacillus of Welch any constant or marked favorable influence.



In a large majority of the cases of gas gangrene there was well-marked hyperpnea and in some cases quite classical air hunger and the picture of acidosis. There is a disposition to serous effusion into the tissues.

The constitutional treatment of the acidæmia of gas gangrene toxæmia has been that of grave diabetic acidosis; an intravenous injection of alkali, followed by lactate of soda by mouth in four doses hourly of 8 grains until the urine becomes alkaline. Five per cent solution of  $\text{NaHCO}_3$  has been employed intravenously. As an anæsthetic for the operation chloroform must be avoided; warm ether gives much better results, and nitrous oxide with oxygen is far the best anæsthetic. Locally 5 per cent salt solution is applied to the wound.

The authors state that by the early administration of alkali the acidæmia may be forestalled and an obstacle placed in the way of the growth of the infective agent.

V. C. HUNT.

**D'Agata, G.: A Case of Mycosis Due to a New Species of Oospora** (Su un caso di micosi, dovuto ad una nuova specie di oospora). *Polichin.*, Roma, 1918, xxv, sez. chir., 81.

The author describes a tumor on the right cheek of a woman from which an organism histologically proved to be a new species of oospora was cultivated and found to produce similar lesions when inoculated into the peritoneal cavity of a guinea-pig.

The author thinks the case of interest to surgeons and pathologists, as it directs attention to the etiology of certain infective processes of granulomatous type produced by organisms of the family mucedineæ which simulate syphilitic or tuberculous lesions.

The new species of oospora is named after D'Agata.

W. A. BRENNAN.

## ROENTGENOLOGY

**Lapham, M. E.: Tuberculosis and X-Ray Plates.** *N. Y. M. J.*, 1918, cvii, 294.

Lapham, writing of pulmonary tuberculosis in children, states that the diagnostic value of the X-ray is diminished by the frequency with which structural changes are found in apparently well children. Positive tuberculin reactions and tuberculous lesions at autopsy, neither preceded by a trace of clinical tuberculosis, are commonly found. These three proofs that tuberculous processes are common, not necessarily associated with the disease called tuberculosis or inimical to health, show about the same percentage of occurrence. Is it possible that these structural changes as seen in X-ray plates, in cases not regarded as tuberculous, are in the nature of living autopsies revealing the same truths as do the tuberculin test and the autopsy?

Beginning with enlarged bronchial glands, then thready infiltrations from the root toward the apex, in successive stages the glands become larger, the infiltrations more massive; then mottling and

nodules are seen and finally the picture typical of undoubted tuberculosis is present. One gains the impression that these changes are permanent and that their development requires time; that tuberculous processes begin in the bronchial glands of children and persist indefinitely. If this is true, then the diagnosis of tuberculosis as a disease depends not so much upon the detection of structural changes in the lungs as upon the recognition or estimation of the effects of these changes upon the health. If it is true that all cases of tuberculosis pass through a period of indefinite duration during which there are no clinical signs recognized as warranting a diagnosis, then the standard of diagnosis for manifest cases will not be suited to the estimation of latent ones. One must be thoroughly informed of the first effects of latent tuberculosis or he will be forced to wait for manifestation. If the first effects are seen in disturbances of the vegetative nervous system and ductless glands, then one should be able to detect these disturbances. If every system in the body is likely to go astray on account of a fundamental fault, then the recognition that this fault is caused by tuberculous processes is important. It seems probable that children's diseases cannot be understood until it is possible to determine whether a disorder in any system is primary or whether it is symptomatic and secondary to tuberculous processes.

Following a detailed report of four cases of ill health, finally presumed to result from latent tuberculosis, the author gives the result of the X-ray study of the lungs in 150 children, 100 being from Highlands and 50 from Atlanta, and all supposedly normal. Twenty-two per cent of the Highlands cases and seventeen per cent of the Atlanta cases did not show sufficient gland enlargement or lung infiltration to deserve the name of structural change.

Lapham's conclusions are, partially, that a research study of the relationship of the perversions of function in the vegetative nervous system and the ductless glands to occult tuberculous toxæmias is needed before deviations from health can be recognized which may represent a tuberculous etiology. This knowledge is especially important since many functional diseases of childhood are symptomatic manifestations of these toxæmias. The best prevention of tuberculosis consists in the earliest possible recognition of the deviations from health caused by the assumption of pathological processes commonly present in the lungs and bronchial glands and usually harmless.

DAVID R. BOWEN.

**Hamburger, W. W.: Roentgenological Studies in the Healing of Gastric and Duodenal Ulcer.** *Am. J. M. Sc.*, 1918, clv, 204.

The author sets forth the following conclusions:

1. A method of roentgenological study of the healing of gastric and duodenal ulcer is described. This method consists of repeated roentgenological studies of ulcer patients before, during, and at

varying intervals after the institution of medical treatment.

2. This method is of value in the diagnosis, prognosis, control of medical treatment, and selection for surgical treatment of gastric and duodenal ulcer.

3. The method is of value in studying the pathology of the healing process in both clinical and experimental ulcer. Thus far it is not of positive value in the differential diagnosis between ulcer and cancer, although in the future it may shed some light on the much discussed problem of the frequency of malignant degeneration of callous ulcer.

4. In the use of the method, the danger of mis-

taking normal peristalsis for penetrating ulcer and of the overlooking of the presence of small ulcer because of incomplete or insufficient examination must be borne in mind.

5. These results are presented only as a preliminary report for the purpose of stimulating work by other men along similar lines. It is in no sense to be construed as the final word on the subject, for each new case, as it is studied, brings its own message and suggests new viewpoints and problems to be interpreted, thus amplifying and possibly negating the conclusions reached in the preceding cases.

## MILITARY SURGERY

**Bertein, P., and Nimier, A.: Early Treatment of War Wounds** (Premières heures du blessé de guerre). Masson et Cie, Paris, 1918.

In the enormous medical literature of the war, scarcely any attention has been paid to the medical service of the front line. The technical rôle of the regimental medical officer and the conditions under which he can perform his perilous task to the best advantage is well set forth in this book, written by two young surgeons who have lived from day to day in the trenches, in the precarious shelter of the dressing station. They offer many valuable suggestions whereby the efficiency of the first treatment of the wounded can be increased.

A bird's-eye view is given of modern warfare, with the peculiarities which distinguish it from the struggles of former times, requiring consequent modifications in the organization and functions of the sanitary service. These functions vary according to the phases of the battle. In the phase which the authors term *tonic*, and which may be prolonged over several months, the losses are at a minimum, and the rôle of the sanitary service is relatively simple at times when offensive actions are suspended. But in the *clonic* periods, on account of the enormous number of troops brought into action, and of the strength of the armament, the losses rise, in attacks and counter-attacks, to the highest figures that can be found in the most bloody battles of former times. The task then imposed on the sanitary service is enormous and difficult.

Aside from bullet wounds with punctiform openings, practically all wounds are contaminated. Shell wounds are particularly grave on account of destruction of the tissues, entrance of infected foreign matter gathered during the flight of the missile and retention of the shell fragment itself in the tissues. These facts demand an urgent and energetic treatment and make clear the obligation on the part of the regimental medical officer to send back the wounded man as soon as possible to the point where disinfection of the wound will be carried out, after dressing and immobilization of the traumatized parts.

The duties of the sanitary service during action may be summarized as follows:

1. To rescue the wounded man as early as possible and carry him to a place of security.

2. If the patient can be transported, to see that he is quickly evacuated to a sanitary formation farther back, after dressing and immobilization of the wounded parts.

3. To maintain and give necessary attention for a few hours in a sufficiently equipped dressing station to the severely wounded who are shocked or untransportable.

4. To carry out proper treatment of hæmorrhage and visceral lesions for which intervention is extremely urgent.

The organization for picking up or rescuing the wounded differs according to whether it occurs during stable trench warfare or in the open field during attacks.

Salvage of the wounded during stable trench warfare usually presents little difficulty or special danger. The chief question requiring discussion is that of the passage of litters along the communication trenches. There is an evident incompatibility between the litter, a rigid, long and cumbersome appliance, and the trench, which is a narrow tortuous passage with sharp angles, lying deeply between the two high walls which are indispensable for security.

The litter should be comfortable for the wounded man; light, so that its own weight, added to that of the patient, does not make an excessive load for the bearers; strong, so that during the journey no breakdown will occur; as small as possible, so that it can pass freely along the narrow passages and enter the small openings of the dugouts. It should finally, and this is a *sine qua non* for a litter to be really effective, be adaptable to either hand, wheelbarrow, or automobile transport, and also be capable of being placed on the ground without modifying the position of the patient or imposing new sufferings on him.

Of all models of litters in present use or those that have been suggested, the authors consider that the



regulation folding stretcher most nearly approaches these requirements, but does not meet the conditions entirely. The regulation litter was designed for mobile warfare, for rescue in the open field, and is quite unadapted to the present form of trench warfare, in which the wounded are evacuated through narrow passages in which the bearers are compelled in order to pass certain angles either to raise the stretcher at arms' length above the parapet, thus exposing the patient to the fire of the enemy, or to subject it to variable inclinations which are extremely painful to the wounded man and tiring to the bearers; or finally to slightly reduce the width of the litter by bending the metal hinge separating the two shafts, thus causing great discomfort.

The authors have devised a litter intended to facilitate the transport of wounded through the trenches, in which the patient assumes a semi-reclining position somewhat resembling the Fowler position or that of a man in a sitz bath. This litter is short, can be allowed to rest on the ground without changing the position of the patient, and the shafts can be fixed at two different widths, allowing the litter to be carried either on the shoulders or at arms' length. The best solution of the problem of transport of the wounded through communication trenches would be to have reserved for this purpose a special passage slightly widened and rounded at the angles, or in cases of very sharp angles, diverticulae could be made to facilitate the negotiation of these corners by the litter.

The salvage of wounded in the open field during attacks is a very complicated and perilous operation, presenting a series of difficulties: some depending on the fact that the wounded, the medical officers and the stretcher bearers are exposed to the fire of the enemy, others upon the nature of the ground to be traversed and the distance to be covered, and at times upon the considerable number of wounded to be transported. The rescue of the wounded soldier is carried out under the menace of either artillery or rifle fire, or both at once. Artillery fire rarely hinders rescue during the day; in fact, this is safer than at night, as the bearers are able to keep better informed as to the zone bombarded by the enemy. In addition, irregularities of the ground can be taken advantage of, the entrance to the trench is more easily found, short cuts may be chosen, swampy or torn-up ground or other obstacles may be avoided. Infantry fire on the contrary renders rescue during the day almost totally impossible in open territory at less than twelve hundred to fifteen hundred meters from the enemy lines. Infantry fire is direct, while artillery fire is indirect, shelling an unseen zone, which affords only a certain number of chances of being hit to those passing through it.

In view of these facts, as far as possible the rescue of wounded in regions exposed to rifle fire should take place during the night, and that of wounded in regions exposed only to artillery fire in broad day-

light. When large numbers of wounded are involved, each patient should not be transported separately to the often distant dressing station, but these men should be grouped as quickly as possible in a nearby shelter so that only after all the wounded are assembled and protected from a new injury and from exposure will they be methodically conducted to the dressing station which perhaps by this time will be relieved of the walking cases arriving there first.

This method of dividing the salvage into two distinct operations requires, if properly carried out, a much greater number of litters than ordinarily provided. It is of the utmost importance that the disturbing of the severely wounded be reduced to a minimum; the patient, once placed on a stretcher, should only be removed from it to be placed on the operating table or in a hospital bed, and sufficient provision should be previously made so that this can be carried out.

Regarding first care on the field of battle, in addition to picking up the wounded, the sanitary service of the first line has a therapeutic function to perform, limited almost exclusively, however, to arrest of hæmorrhage. This must often be carried out by the apparently brutal constriction afforded by a belt, strap, shoe-lace, or bandage, when the classical tourniquet is not available. The immediate application of this temporary hæmostasis is many times absolutely necessary to save the life of the patient until he can be given proper care at the dressing station.

Another less urgent therapeutic indication is immobilization of fractures. All the classical treatises on war surgery describe improvised immobilization apparatus, but all are too complicated to be employed on the battlefield. The authors believe that for this purpose the most simple immobilization for fractures of the upper limb consists in fixing it to the thorax with a few turns of a bandage. In fractures of the lower limb, immobilization is accomplished by using its fellow of the opposite side as a splint. When the two lower limbs are fractured, a temporary splint may be improvised with a rifle or stake placed between the two limbs and fixed to them. In addition to these essential indications, it is advisable before transportation of the wounded man to apply a temporary dressing. While this from a practical standpoint may have no real therapeutic value, it has a moral effect as an indication of the interest taken in the suffering of the patient. Of more value is an injection of morphine or ether or a swallow of tea to lessen the pain, to stimulate the patient, and to decrease the waste of nerve force.

The authors next consider the organization of dressing stations. There exist usually in each sector a series of aid stations placed one behind the other, commencing with the battalion aid station very close to the front line. Further back is found the central regimental dressing station, and still farther to the rear the division dressing station. The



regimental aid station, two hundred to five hundred meters behind the line, is only a primary shelter for the wounded, where one or two surgeons are to be found to offer urgent attention to the wounded. The infantry regiment, having three battalions, two on the front line and one in reserve, usually has three dressing stations, one for each battalion in line and the third serving as the central dressing station, the latter being the most important.

This station should be placed in an accessible spot, at the same time sufficiently distant from the front to place it out of danger in case of fluctuation of the line or of surprise attacks. It should be near the main road between the front and the rear. The dressing station should be protected from shelling, in a dugout, a deep sap, or a natural cave. Its approaches should be studied so as to facilitate the entrance and exit of litters, steep steps and crooked passages being avoided. The approaches should be carefully guarded from the view of the enemy.

Two openings should be provided, one for entrance and one for exit, for ventilation, to aid the more rapid movement of the wounded, and also to permit escape in case one of the openings should be closed by bombardment. In some cases it may be possible to have the walls boarded and a plank floor. It is advisable to have the station divided into two compartments connected by a passage. One of these may be used as a dressing room and the other as a waiting room for the wounded. These central dressing stations should be capable of holding twenty to thirty patients, with facilities for keeping the more serious cases for several hours.

The question of necessary supplies for these dressing stations is discussed in detail, including litters, blankets, clothing, dressings, splints, instruments, antitetanic serum, drugs, water and food. The personnel comprises two surgeons, two non-commissioned officers, and six men at the outside, working in two shifts.

Repetition of dressings at the different stations through which the wounded pass must be avoided. Each new dressing means new suffering, diminishing the resistance of the patient, increases the shock, and aggravates the prognosis of the wound. The necessarily dirty dressing applied in the trench by a comrade must not be followed by a mediocre dressing at the advanced dressing station, and then by a passably clean one at the central station and perhaps even a fourth of the same kind at the divisional dressing station, all this before the patient receives the only truly useful dressing, that which is performed by the surgeon after disinfection of the wound.

The principal function of the dressing station is to evacuate the patient as early as possible in the direction of the operating room. There should be no attempt at diagnosis when this is not immediately evident on superficial examination. It is important to see that the station does not become overcrowded. The aids should see that there is plenty of hot tea, and attend to the injections of

antitetanic serum. Each patient leaving the dressing station is provided with a card, briefly stating what has been done for him, particularly as regards application of a tourniquet or injection of antitetanic serum.

The treatment of the wounded in the dressing station is considered under the following headings: (1) infection; (2) shock; (3) hæmorrhage; (4) fracture of the limbs; (5) wounds of the thorax; (6) wounds of the skull; (7) wounds of the abdomen.

1. *Infection.* It is important to note that there is a free interval of from nine to twelve hours after soiling of the wound by the projectile before infection develops, therefore the patient should whenever possible have his wound disinfected before this time elapses. This is the task of the field hospital, and the duty of the regimental medical officer is to make every disposition for sending back his wounded to the surgical field hospital as quickly as possible. As to the dressing applied to the wound at the regimental dressing station, the usual superficial application of tincture of iodine is useless. Good results have been seen from the insufflation into the deepest parts of the wound of the antiseptic powder suggested by Vincent, consisting of a mixture of ten parts of calcium hypochlorite and nine parts of powdered boric acid. The insufflator is provided with a long glass cannula introduced into the wound. The dressing over the wound should be abundant and firmly applied, for the principle of immobilization of wounds of the soft tissues is as important as in fractures. Injection of antitetanic serum should be obligatory.

2. *Shock.* This should be distinguished from collapse due to hæmorrhage, because the latter demands local treatment in addition to general. The two capital symptoms to be combated are chilling and hypotension. For increasing body temperature the limbs of the patient are to be covered with cotton wadding, and surrounded with hot water bottles. A hot air appliance of simple construction is available, consisting of a lamp with a conical cover from which the hot air is conducted under the blanket of the patient through a simple stove pipe. To raise arterial pressure the patient is placed with the feet raised, an injection of camphorated oil is given every two hours, and normal saline solution administered subcutaneously or intravenously. These patients suffering from shock, with the exception of those with abdominal wounds which should be immediately evacuated, should be kept if circumstances permit, until the arterial pressure and the general condition recovers, usually within twelve to twenty-four hours.

3. *Hæmorrhage.* The regimental surgeon should never release the patient until hæmostasis has been achieved. Hæmorrhage in jets from wounds of large vessels is rarely seen, because the patient dies before help can reach him. Sometimes spontaneous hæmostasis is observed, or bleeding from a large vessel may occur subcutaneously, producing a hæmatoma. The form of hæmorrhage most com-



monly observed is a general oozing. The differentiation of hæmorrhage from shock is of little practical importance because the treatment is the same with the addition of local control of the bleeding. In the treatment of hæmorrhage in the front line, the use of the tourniquet is too frequent; it should only be employed in default of other measures for hæmorrhage in jets. The tourniquet should never be applied without interposition of a compression pad such as a rolled bandage over the vascular tract. The omission of this compressor is dangerous, the equal constriction about all the circumference of application arresting the circulation of the limb, not only as regards the bleeding vessel, but compressing the others also. This ischæmia renders the limb an easy prey to anaerobic bacteria growing in the wound, leading to gangrene. If a tourniquet has been applied, this fact should be noted on the evacuation card of the patient. Whenever possible, the tourniquet should be discarded in favor of direct hæmostasis by forceps, either left *in situ* or replaced with ligatures. Oozing hæmorrhage should never be controlled with the tourniquet. It can be controlled by direct pressure with gauze packing.

4. *Fractures of the limbs.* Immobilization has for its objects the avoidance of injury of the neighboring nerves and blood-vessels by sharp edges of bone, the prevention of undue suffering of the patient, and the retarding of infection at the site of fracture. To accomplish these ends, immobilization must be firm and must include the articulations above and below. The authors consider the most suitable material for making splints to be ordinary green blind. This is easily transported in rolls, can be cut to convenient sizes, and readily accommodates itself to the shape of the limb. In fracture of the upper part of the humerus, simple fixation of the entire limb to the chest with a bandage is all that is necessary. In fracture of the thigh, the sound limb serves as a splint, the two limbs being then immobilized to the litter by the girths of the latter.

5. *Wounds of the thorax.* Only those with serious symptoms require special treatment at the dressing station. In ordinary cases all that is necessary is to send the patient on his way to the field hospital after immobilization of the chest as far as possible with a firm bandage, raising this part of the body by placing a folded blanket under the shoulders, and diminishing the tendency to coughing and hæmoptysis by an injection of morphine and emetine. In the case of large open wounds of the thorax, the opening should be closed by a tight gauze packing in the form of a "shirt button." These patients are only evacuated after improvement of the respiration and circulation.

6. *Wounds of the skull.* No attempt at diagnosis of these injuries should be made at the dressing station. Treatment should be confined to cleansing of the scalp, shaving the hair around the wound, application of a simple flat dressing, and evacuation to the field hospital as soon as possible.

7. *Wounds of the abdomen.* Patients with abdom-

inal wounds should be evacuated as quickly as possible, even shock not being a contra-indication on account of the impossibility of distinguishing it from intraperitoneal hæmorrhage for which early intervention is the only chance of safety. The consensus of opinion at present is in favor of early intervention in all cases of abdominal wounds. The exigences of war however do not permit the organization of specially equipped stations in which to uniformly carry out these operations near the front line. At the present time circumstances do not allow special discrimination in favor of abdominal wounds except in isolated instances. The best that can be done is to get back the wounded as quickly as possible for hospital treatment.

In conclusion, the authors point out the defects of the present system of organization of the medical service based on the regimental unit. At present, a regiment goes up into the line, taking with it all its medical personnel which, officers and men, replace those of the regiment relieved. The new medical personnel brings with it its supplies, the personnel retiring takes its supplies away, never exchanging. Thus every week or two weeks there is a complete change of organization; there is no chance to properly fit up the dressing stations nor learn the best and safest routes for transportation of the wounded. As a remedy for this condition, it is suggested that the medical service of the front line should be divided into two distinct parts.

1. The medical service of the regiment itself, moving with the regiment and confining its duties to those exclusive of the care of the wounded. The personnel of this service could be much reduced.

2. The service for the wounded, which would be independent of the regiment but belonging to the sector and under the direction of the Chief Surgeon.

The Chief Surgeon should have charge of the division of the sector into zones, the formation of groups of stretcher bearers, the selection of stations for these, the routes which they must take to convey the wounded to the dressing station, and finally the creation of dressing stations under good conditions. In this manner the rescue of the wounded would be quicker, more methodical, less dangerous, being carried out by a personnel knowing the sector. With the installation of dressing stations worthy of the name, with more surgical facilities, the wounded would receive early and efficient care.

These surgical posts ought to assure: aseptic dressing of all wounds; correct immobilization of fractures; rest and treatment of shocked patients; operative arrest of hæmorrhage by packing, or exceptionally ligation of a large vessel; packing or suture of open chest wounds; amputation; tracheotomy. Indications for this latter operation are very rare, being confined perhaps to fractures of the jaw with descent of the tongue into the pharynx. These cases however are more readily and safely treated by drawing out the tongue and fixing it with a ligature. The anæsthetic of choice for first line work is ethyl chloride.

R. H. IVY.

## GYNECOLOGY

### UTERUS

**Curtis, A. H.:** A Combined Bacteriological and Histological Study of the Endometrium in Health and in Disease. *Surg., Gynec. & Obst.*, 1918, xxvi, 178.

After exhaustively reviewing the literature pertaining to chronic endometritis, including physiological, pathological and bacteriological studies, Curtis details his reports and presents his views upon the bacteriology and histology of the endometrium from 118 uteri removed by operation.

He considers four classes of cases: (1) nulliparæ without history or gross evidence of infection; (2) nulliparæ with history or gross evidence of infection; (3) parous women without history or gross evidence of infection; (4) parous women with history or gross evidence of infection. Of the 118 uteri studied there were 101 endometria that showed no growth of bacteria, while there was a growth, either in pure or in mixed culture, in the remaining 17.

The comparative bacteriology and histology of the endometrium is very compactly shown by a table, from which it may be seen that bacteria are very rarely found unless there is also an infiltration with polynuclear leucocytes, plasma and round cells. Many times one of these cellular elements is present when no bacteria are present, but the combination of all three elements is rare.

But, the author remarks, it must be admitted that future improvements in cultural methods may yield bacteria from endometria with only mononuclear cell infiltration.

From this study the author draws the following conclusions:

1. The endometrium of nulliparæ without history or gross evidence of pelvic infection is almost invariably free from bacteria and is also microscopically normal.

2. Almost all women who have undergone normal pregnancy, with pelvic history otherwise negative, likewise possess bacteria-free endometria.

3. Patients with a history of chronic infection, from whose endometrium bacteria are obtainable, almost all have salpingitis with equally good growth. Chronic endometritis, *per se*, with bacteria present in smears or cultures, is practically to be ruled out as a clinical entity.

4. The gonococcus is the organism most commonly found in the uterus. Streptococci and diplococci are less common. The latter appear to live longer in the tissues than the gonococci and can apparently be isolated long after all infection seems to have disappeared.

5. Bacteria have seldom been found unless

there is infiltration with polynuclear leucocytes in addition to plasma and round cells.

6. It is a wise precaution to sterilize the cervical canal by iodine, as far as it is patulous, before any attempt is made to pass instruments into the uterine cavity. Bacteria are often present in the endometrium following curettage by the technique commonly employed.

7. It would seem desirable, other conditions being equal, to operate immediately at the close of menstruation, for at this time there exists a polynuclear leucocytosis, which, to some extent, at least, aids the convalescence.

8. At the time of hysterectomy or of subtotal hysterectomy, if the tubes and other pelvic viscera are healthy, spread of infection from the endometrium need not be feared, the only exceptions being the presence of pyometra or recent exploration of the uterus.

9. Intra-uterine therapy is of little avail, for the most important focus of infection is well beyond its reach. In the cervix there are many glands that harbor infection, and it is against discharges from the cervix that treatment can be efficiently directed.

HARVEY B. MATTHEWS.

**Sampson, J. A.:** The Escape of Foreign Material from the Uterine Veins. *Tr. Am. Gynec. Soc.*, Phila., 1918, May.

Radiographs of the uterus, tubes and ovaries in which the uterine cavity has been injected with bismuth, introduced through the cervix, show the form of this cavity under various conditions; and also by what channels and under what circumstances the bismuth may escape from the uterus.

If the tubes are patent the bismuth escapes into them; the ease with which this occurs varies with the degree of patency of the tubes. These experiments suggest that intra-uterine irrigations are attended with the danger of some of the irrigating fluid at times escaping through the tubes into the peritoneal cavity; and also that fluid in the uterine cavity, under favorable circumstances (patent tubes, relaxation of the uterus, and obstruction in the cervix), may be forced into the tubes and peritoneal cavity. This is one way that salpingitis and peritonitis may arise.

If the endometrium is intact the bismuth will not escape into the venous uterine sinuses even though great force is used. If the patient is menstruating when the uterus is removed, the bismuth may gain access to them. If the endometrium is removed by curettage, the injection mass will usually escape into these sinuses. The ease with which this occurs varies with the size of the sinuses in the individual specimen and the degree of relaxation of the uterine



wall. Under favorable circumstances of venous hyperæmia and uterine relaxation, the bismuth easily escapes into the venous sinuses and into the venous circulation outside the uterus.

A study of uteri in which the venous system has been injected with bismuth through the uterine and ovarian veins shows a rich venous plexus in the endometrium and also one in the myometrium. The latter may be subdivided into a peripheral and radial plexus, situated in the peripheral and radial zones. Arcuate veins between the two zones convey the venous blood to the uterine plexus between the layers of the broad ligament.

Relatively large sinuses radiate from the base of the endometrium into the myometrium, and convey the blood from the endometrial plexus into the deeper portion of the radial. If these "receiving" sinuses are exposed by removing the overlying endometrium and the uterus is relaxed, thus holding the lumina of the "receiving" sinuses open, fluid and small solid material could easily escape from the uterine cavity into them and thence into the venous circulation outside the uterus.

Clinical experience has taught that solid material from the uterine cavity gains access to the venous circulation, as shown by puerperal infection and the presence of placental cells, benign and malignant, in the lungs of puerperal women. Experimentally solid material can be forced from the uterine cavity into the venous circulation under very little pressure if these sinuses are exposed and the uterus relaxed.

Anatomical and physiological studies demonstrate how this may occur, by exposure of the lumina of the receiving sinuses, uterine relaxation, and pressure in the uterine cavity greater than that in the sinuses. The author believes that uterine contraction following relaxation, when there is obstruction in the cervical canal and intra-uterine irrigation, may bring about this increased pressure and may force fluid, sterile or containing in suspension bacteria or placental cells, into the venous circulation. It is probably a frequent way, by which puerperal infection arises and placental cells reach the lungs.

#### ADNEXAL AND PERIUTERINE CONDITIONS

**Mauclaire: Ovarian Auto- and Homografts in the Lower Edge of the Omentum** (Autogreffes et homogreffes ovariennes dans le bord inférieur de l'épiploon). *Ann. de gynéc. et d'obst.*, 1917, xlii, 720.

The author reviews the recent literature concerning ovarian grafts. His earlier experimental at-

tempts at ovarian grafting generally failed. Recently, because he thought the failures might have been due to the fact that the graft was placed in a poorly vascularized region, he has tried grafting the ovary in the omentum. He is aware that Hertlitzka and Foa experimentally grafted an ovary on the omentum but not within it.

In several of his patients, after having grafted the ovary in the omentum, he fenestrated the latter and hemmed the omentum all around the ovary. The secreted ova could then fall into the pelvis and be absorbed. It is known that normally the ovum falls often into Douglas' sac. But in some cases Mauclaire has sutured the preserved tube to the grafted ovary and thus the escaping ovum can enter the tube, obviating an extra-uterine pregnancy. It is well known now that pregnancy after an ovarian graft is no myth.

The author has made 10 intra-omentum ovarian autografts without complications and in 8 of these cases the patients have menstruated. The omentum has not absorbed the graft. The periods were sometimes early, sometimes much deferred and the discharge also varied in quantity. The author thinks that in the omentum the graft is rapidly vascularized in all its parts, much more so than when grafted in other regions.

The author has made 6 intra-omentum ovarian homografts. These were taken from patients operated upon for uterine fibroma in whom there was neither tuberculosis nor syphilis. In 2 of these 6 cases menstruation has returned. The difficulty in such cases arises from the fact that the donor of the grafted ovary has usually passed the fortieth year and the ovary is old. In the case of an ovary taken from a fibromatous woman of 33 years there was a good result. In one case not only did the menses return but the breasts secreted milk.

The summarized conditions for successful ovary grafting are: to operate aseptically and dispense with a general anæsthetic; not to contuse the ovary nor make fragmentary grafts; the bed of the graft must be highly vascular and the grafted ovary must be young. The recipient must be the same sex, species and race as the donor, and if a female she should not be pregnant.

A medicolegal question arises as to who is the true mother in the case of a homo-ovarian graft followed by pregnancy. Is it the donor of the ovary or the recipient?

Short histories are appended of the cases of autografts and homografts. W. A. BRENNAN.

## OBSTETRICS

### PREGNANCY AND ITS COMPLICATIONS

**Bevan, A. D.: Ruptured Extra-Uterine Pregnancy; Confusion with Appendicitis.** *Surg. Clin. Chicago*, 1918, ii, 65.

Bevan reports a case of ruptured extra-uterine pregnancy in a patient who had been married six years and had never been pregnant. She was brought to the hospital with an acute abdominal attack, which came on forty-eight hours previously, without much temperature, some vomiting, and distinct tenderness over the region of the appendix, and pain so severe that she had to go to bed immediately at the onset. There was no history of pelvic disorder and the case was regarded as one of acute appendicitis.

Under ether anæsthesia the usual muscle-splitting appendectomy incision was made. Free blood was found in the peritoneal cavity. The blood was not fresh, contained some clots, and appeared to have been present for twenty-four or forty-eight hours. The right tube was distended. It was clamped and removed. The right ovary was left intact. The other appendages were normal. The case proved to be that of a tubal pregnancy. G. W. HOCHREIN.

**Poucher, J. W.: Pre-Eclamptic Cæsarean Section.** *Am. J. Obst.*, N. Y., 1918, lxxvii, 54.

Poucher strongly contends that in the pre-eclamptic state the safety of both mother and child depends upon emptying the uterus as rapidly as possible. He would not apply any rule of procedure to all classes of cases, but says:

"In women who have borne one or more children, where labor has safely begun, and the cervix thinned out, delivery may be easily and rapidly accomplished by means of rubber bags and normal dilatation under ether. This is the class of cases which I believe may be greatly facilitated by vaginal hysterotomy. But a large majority, 75 per cent or more, of eclamptic women are primigravidae, many of them with rigid elongated cervixes. In these cases delivery by rapid dilatation either with rubber bags, by manual manipulation, or even by hysterotomy, is a difficult task of sometimes many hours' duration and may in spite of the utmost care be fraught with danger to the child and, through toxæmia and infection, to the mother. In these cases cæsarean section offers by far the best results."

Since 1914 the author has treated twelve cases of pregnancy toxæmia, seven by cæsarean section, with no foetal or maternal mortality. The other five cases were seen after they had been some time in convulsions, two being treated by cæsarean section, two by vaginal hysterotomy, and surgical inter-

ference in the fifth being refused. Of these but four mothers and one child survived.

Poucher's entire cæsarean experience has consisted in 51 cases and he is more than ever convinced that the time to stop convulsions is before they begin. Further, he does not believe that a patient in pregnancy toxæmia should be allowed to suffer hard or prolonged labor pains.

CAREY CULBERTSON.

**Tomiselli, A.: Status Epilepticus in Pregnancy** (Status epilepticus in gravidanza). *Ann. di ostet. e ginec.*, Milano, 1917, xli, 135.

The author draws attention to the similarity of the symptoms of epilepsy and eclampsia during pregnancy. While eclamptic convulsions are an indication for evacuation of the uterine contents, epileptic seizures do not indicate such a course. The details of a case are given.

The patient, aged twenty-five, was in the fifth month of pregnancy and came to the hospital with a diagnosis of eclampsia and a history of having previously suffered from convulsive seizures. During the first day in the hospital the patient had 11 convulsions. The nature of these, as well as urinary findings and the history, suggested epilepsy. An energetic bromide treatment was instituted. After a few days the symptoms subsided, the patient recovered, and the pregnancy proceeded to term with normal delivery.

The author refers to the literature on the subject to show that pregnancy does not aggravate epilepsy. He draws attention to the necessity of an exact and careful investigation of the symptoms, as the differentiation between eclampsia and epilepsy calls for separate treatment; that which is suitable for the one may be fatal for the other under the conditions.

W. A. BRENNAN.

**Solomons, B.: Notes of Two Obstetrical Cases: Epistaxis in Pregnancy; Albuminuria of Pregnancy.** *Med. Press*, 1918, cv, 123.

The patient was a healthy primigravida, aged twenty-five. The family histories of the wife and husband were good. She had had several slight attacks, and when the author saw her the nose was bleeding profusely. The urine and blood-pressure were normal. The patient bled profusely for five days in spite of treatment with coagulose, anterior packing and adrenalin. Forty-nine hours after posterior packing of the nose, she was delivered by forceps of a freshly macerated female child weighing five and three-fourths pounds, having been in labor for eight hours. The plug was removed the next morning. It had been in about two days and a half. The convalescence was marked



by slight pyrexia in the first week, but the patient was able to leave the hospital at the end of the third week.

Whether one can promise a non-recurrence of the bleeding in subsequent pregnancies, and whether, in the event of the bleeding occurring, if one would act differently, are matters for discussion.

The second case was one of albuminuria of pregnancy. The patient was put on a water diet and labor induced by Krause's method. A live baby and a healthy mother were the result.

EDWARD L. CORNELL.

**McSweeney, E. S., and Wang, S. L.: Childbirth and Tuberculosis.** *J. Am. M. Ass.*, 1918, lxx, 368.

After admission to the hospital, the taking of the history, the physical examination and the obtaining of specimens of urine, sputum, etc., were done in the general female admission wards where the patient was placed in bed for an observation period of about two weeks, as is the custom with all tuberculous patients. Then, in case of pregnancy, the pelvis was examined, a vaginal smear examined for gonococci, and Wassermann and gonococcic fixation tests made. After the usual two weeks of observation in the admission ward, where the stage of the disease and the mode of sanatorium treatment were determined, the woman was transferred to the obstetric ward. In the obstetric ward the care was the same as for all tuberculous patients, the amount of exercise allowed being dependent on the activity of the tuberculosis and the general rules observed in pregnancy.

These patients seemed well satisfied and their being together seemed to add to their contentment. Their meals were served to them in this ward and to satisfy their natural reticence, they were allowed to remain as much apart from other patients as they desired. This ward was not, however, closed to other patients, for this was not feasible and obviously not desirable.

When labor occurred, the woman was removed to the surgical pavilion for reasons of asepsis, and brought back to the obstetric ward shortly afterward. She was placed in a single room for two or more weeks and treated as any other maternity patient. The child was removed immediately after labor to the children's pavilion. The child was not permitted to nurse, being fed artificially from birth. The parents were advised that the child should be sent to a tuberculosis preventorium for one year at least, and if they acquiesced, this was done as soon as it could be arranged. The mother was confined to bed while the uterus was undergoing involution, and after this, if all things were favorable, she was cared for according to the usual sanatorium methods for tuberculous patients.

There were eighteen childbirths, one patient having two children born in the hospital, the second three years after the first birth.

Ten stated that the onset of their clinical tuber-

culosis occurred before pregnancy; of these, after labor four died, three seemed improved, and three seemed unimproved. Three stated that the onset of their clinical tuberculosis occurred at about the time they became pregnant; of these, after labor one died and two seemed improved. Five stated that the onset of their clinical tuberculosis occurred after they became pregnant; of these, after labor four seemed improved and one seemed unimproved.

During pregnancy, as near as could be ascertained, ten seemed to retrograde, five to improve and three were apparently unchanged.

After labor, of the moderately advanced, seven were improved; of the far advanced, five died, one improved and five were retrograde.

EDWARD L. CORNELL.

**Mazzini, E.: Didelphic Uterus and Pregnancy; Torsion of the Gravid Cornua** (Utero didelfo y embarazo; torsion del cuerno gravido; apoplegia utero-placentaria; ooforo-salpingo-hemi-histerectomia abdominal sub-total; curacion). *Semana med.*, Buenos Aires, 1917, xxiv, 630.

The author reports the case of a primipara aged 22 years, with an unimportant previous and family history. She entered the hospital dyspnoeic, pallid, with the abdominal facies, and discolored mucosa. Temperature was 35°, pulse 120 to 130. The tongue was dry, there was intense thirst, pyrosis, and vomiting. The abdomen gave the impression of a pregnancy at term. The fundus of the uterus showed in the hypochondriac region and left flank. The uterus was irregularly triangular in form. Its height was 33 cm., which did not agree with the state of the pregnancy, in the beginning of the seventh month. The upper segment gave a wooden dullness on percussion. In the lower third palpation was impossible owing to distention and hyperplasia. The patient stated that the uterus had commenced to increase two hours before her entrance into the hospital.

Examination showed a septum commencing at the vulva and continuing upward, giving the appearance of two vaginae. Palpation discovered in the right vagina a vague and interrupted sensation of continuity between it and the neck of the gravid uterus in left lateroflexion. A diagnosis of didelphic uterus was made.

A median sub- and supra-umbilical laparotomy was done. The gravid hemi-uterus proved to be of a volume corresponding to term, of an intensely livid color and with a torsion of 180°. The left hemi-uterus was in forced lateroflexion. The gravid uterine horn was removed. The cervico-utero ligamentous pedicle was sutured and peritonized. Peritoneal phenomena persisted for 72 hours. Cicatrization was by first intention. The patient was up on the twentieth day.

On opening the tumor, about 500 ccm. of sero-hæmatic fluid escaped; the fœtus corresponded to the month of the pregnancy. On extracting the fœtus it was seen to be well developed. There was a



partial separation of the normally inserted placenta with hæmorrhagic subchorial suffusions and distention of its vessels.

The author gives detailed descriptions of the macro- and microscopical examinations with illustrations, and discusses the literature of the subject, comparing the points to his own case.

W. A. BRENNAN.

#### LABOR AND ITS COMPLICATIONS

**Skeel, A. J.: Injuries Accompanying Labor.** *Cleveland M. J.*, 1918, xvii, 83.

The author has kept records of careful examinations made two to six weeks postpartum for several years and finds that many cases considered satisfactory at the time of and even two weeks after delivery have remained with permanent uncorrected injuries. This led him to improve and modify obstetrical technique and postpartum care, achieving much better final results for the patient.

Labor injuries are divided into: (1) pelvic floor and outlet injuries; (2) cervix and vault injuries; (3) injuries of the supporting uterine ligaments. As much damage is caused by a large and hard head, it is best to safeguard the patient and child by not allowing the pregnancy to go over term; when reasonably certain that pregnancy has reached full term, labor should be induced.

Occiput posterior positions are responsible for a great deal of pelvic floor injury. There is usually a splitting of the pelvic wall into the ischio-rectal fossa, an injury not readily discovered except by inspection with a speculum and a good light. The old custom of urging the patient to bear down causes the head to strike the upper portion of the levator ani muscle when the perineum proper is still perfectly safe. In patients with a narrow pubic arch unusual care should be taken during delivery, as this anomaly favors third degree lacerations. When the perineal muscles are very rigid, ether anæsthesia should be used to the point of relaxation. The vestibule and subpubic region should be protected. Uterine prolapse frequently follows rather than accompanies cystocele. Rupture of the anterior portion of the triangular ligament allows descent of the bladder with the uterus following it. In the repair of the perineum the muscles and fascia should be brought together with buried catgut sutures with a short curved needle, then the mucosa and skin are sewed up. In extensive injuries one or two silk-worm stay sutures are inserted to safeguard premature absorption of the catgut. The cervix should be inspected and if suturing is required, the upper angle should be well united. This must be done under the strictest asepsis, and never in the presence of gonorrhœa or other infections. On account of the relaxed and stretched uterine ligaments retroversion is rather common following delivery. Prophylaxis is advised; avoidance of strain on the part of the woman, as well as avoidance of counterpressure over the fundus during the severe second stage. Free motion

in bed is allowed early. The patient is urged to lie on her abdomen, whenever possible. Vaginal examination in twelve to fourteen days is made and if retroversion is found, the knee-chest posture is instituted, and later the uterus is replaced and a Smith pessary introduced. In old standing cases surgical interference may become necessary.

L. R. GOLDSMITH.

#### PUERPERIUM AND ITS COMPLICATIONS

**Nyulasy, A. J.: The Care of the Puerperal Woman; Polypoid Decidual Endometritis.** *Surg., Gynec. & Obst.*, 1918, xxvi, 331.

The first case of this condition was described in 1861 by Virchow. Since then various observers, notably Ahlfield and Nyulasy of Melbourne, have demonstrated the condition to be rather common. Syphilis is the most potent cause, though any low-grade irritant extending over a long period, such as the gonococcus or the common pyogenic cocci, may also act as an etiologic factor. It is a disease of the decidua, and may or may not lead to abortion; many of the typical cases occur after full labor.

Clinically it presents two types: either a tough, somewhat rounded polypoid eminence of various sizes, or leathery papillomatous outgrowths. There is a marked tendency toward infective changes. The symptoms may be abortion, adherent placenta or sepsis after the full-term placenta has come away perfectly clean. In such cases septicæmia may come on without noticeable fetor of the lochia, the patient having been apparently well and free from any premonitory symptoms.

Retarded involution with a patulous os admitting one or two fingers should be carefully watched, and the unduly large uterus explored under anæsthesia and the diseased decidua removed. This will prevent fatal septicæmia.

In the treatment the sharpest curette should be used for removing the decidua. The author found the bare finger nail a good aid to the curette. After curettage the uterus is packed with iodoform gauze, and in some cases intra-uterine douches are used for several days. On account of the enormous venous sinuses hæmorrhage may be very severe; this necessitates packing and another sitting. In an obstinate case it was necessary to do an anterior vaginal metrotomy to facilitate the removal of the decidua. The author has not lost any cases, unless grave septicæmia was present at the beginning.

Three illustrations of pathologic slides accompany the article.

L. R. GOLDSMITH.

**Bassewitz: Two Cases of Placental Retention Treated by the Gabastou Hydraulic Method** (Nota acerca de dos casos de retencion placentaria tratados por el metodo hidraulico de Gabastou). *Semana méd.*, Buenos Aires, 1918, xxv, 85.

Two cases are reported in which Bassewitz tried the new method of hydraulic detachment of the placenta devised by Gabastou of Buenos Aires. Ow-



ing to the dangers of manual extraction, the author proposed to inject into the placenta by the vein of the umbilical cord sterilized physiologic salt solution in sufficient quantity to obtain a kind of erection, followed by the formation of a retro-placental hydroma which greatly facilitates mechanical detachment of the placenta. In the first of the two cases in which the method was tried, elimination of the placenta by its foetal face was obtained in five minutes. In the second case, however, manual detachment of the placenta was necessary.

The method appears to be effective in cases of total placental retention due to uterine inertia or to anomalous adhesions between the uterus and placenta. It is inefficient, or at least not sure, in cases of partial lateral detachment of the placenta which yield to the Duncan method. The method is dangerous and ought to be avoided in cases of lateral tubal placental insertion. W. A. BRENNAN.

#### MISCELLANEOUS

**Berghausen, O.: Hæmorrhagic Disease in the New-born Treated by the Injection of Citrated Blood in the Superior Longitudinal Sinus.**  
*J. Am. M. Ass.*, 1918, lxx, 514.

The author reports a case of uncontrollable hæmorrhage in an infant, which he had delivered by forceps, treated by the injection of 150 to 200 ccm. of the father's blood in 2 per cent sodium citrate solution into the superior longitudinal sinus. Intramuscular injection of paternal blood, suture of the wound caused by the forceps blades, pressure, epinephrin, and a blood-coagulating substance all had been used without success. Also unsuccessful

attempts had been made to introduce the citrated blood into a vein at the elbow and in the neck.

As a last resort, it was determined to puncture the superior longitudinal sinus. This was done and 150 to 200 ccm. of the citrated blood introduced. Immediate improvement in the child was apparent and no hæmorrhage occurred after the transfusion.

HARVEY B. MATTHEWS.

**Salmond, W.: A Case of Ischiopagous Twins.**  
*Lancet*, Lond., 1918, cxciv, 295.

The parents to whom this monster was born are both natives of Natal. The mother is about 27 years of age and had previously given birth to two healthy children. She had no special difficulty in the present labor and no medical man was present. The living monster was seen when it was seven days old, and as it did not seem likely to survive, it was photographed. It died the next day.

Both bodies were of the female sex and presented perfect vulvæ, but urine only escaped from one. There were also two anal orifices, but likewise fæces escaped from only one. Each mouth took food and the children cried independently. One child would sleep while the other remained awake. There were two hearts which did not beat synchronously, and the respiratory movements in each chest were independent. There was only one umbilical cord. There were normal movements of all the four arms and of two legs. The third, or fused, leg had nine toes. The evidence of movement was less apparent at the ankle and knee-joints and absent at the hip, although there was a distinct articulation to the single pelvis.

An unsuccessful attempt was made to secure the skeleton.

EDWARD L. CORNELL.

# GENITO-URINARY SURGERY

## KIDNEY AND URETER

**Hirsch, E. F.:** A Papillary Carcinoma of the Kidney with Metastasis in the Brain. *Arch. Int. Med.*, 1918, xxi, 231.

So rare is papillary carcinoma of the kidney that only twelve cases of such tumors have appeared in the literature.

The author's case was one which at necropsy showed a soft, fleshy tumor in the left kidney and a large tumor thrombus projecting in the corresponding vein. In addition there was noted another tumor definitely metastatic in the anterior pole of the left temporal lobe of the brain.

The patient was an adult, fifty-eight years of age, who had been admitted to the hospital about eight weeks before death with a rather indefinite history of a skull injury. At the time of the admission there were some disturbances in mentality, which led the attending surgeon to perform an operation upon the calvarium. About ten days later a second exploration of the cranium was made. There was no improvement in the condition and the patient gradually grew worse mentally, finally dying in a state of apathy and emaciation.

The microscopic examination showed a malignant papillary tumor which had arisen in the renal parenchyma.

The brain tumor showed a histologic structure similar in most respects to the tumor found in the kidney.

P. H. KREUSCHER.

**Chevassu, M.:** War Wounds of the Kidney (Plaies de guerre du rein). *Bull. et mém. Soc. de chir. de Par.*, 1918, xlv, 81.

Chevassu's report is based on 56 kidney war wounds observed, 46 being recent and 10 being old wounds. Hæmaturia does not necessarily accompany a renal wound, and in 12 cases in which a renal lesion was actually verified there was hæmaturia in 5 only. The kidney wound was accompanied by a liver lesion 11 times, by a lung lesion 9 times, and by lesions of other viscera in 11 cases. In 21 cases the kidney lesion was isolated.

The conditions which make an isolated kidney wound dangerous are hæmorrhage and infection. In 46 fresh kidney wounds severe hæmorrhage was observed in 6. In 3 of these cases where there was a concomitant liver wound, the patients died. In 3 of the cases the hæmorrhage was a hæmaturia; 2 died within a few hours. In 5 cases a perirenal hæmatoma was produced. Of 35 remaining patients who showed no special symptoms necessitating immediate action, a primary operation was done in 11 cases, a secondary operation in 2, and abstinence was observed in 22. The primary operation

consisted either in a nephrectomy or in cleansing and drainage of the trajectory. Of 3 nephrectomized cases, 2 died; of 4 tamponed patients, 3 died; 1 hæmatoma drained recovered; 5 clearance and drainage operations recovered; 22 abstentions from surgical intervention gave 3 deaths and 19 recoveries.

Classified according to the nature of projectile, 21 shell wounds gave 16 evacuated and 5 dead; 14 bullet wounds gave 10 evacuated and 4 dead; 28 cases with projectile retained gave 10 deaths; 18 seton wounds gave 4 deaths. The very considerable proportion of dead in the case of retained projectile is due to the persistence of hæmaturia and secondary hæmorrhage.

A severe hæmaturia of itself is never an indication for nephrectomy unless abundant and persistent. The kidney is of itself perfectly able to effect hæmostasis in the majority of cases and should not be removed unless the hæmorrhage really threatens the patient's life. The author's experience leads him to think that tamponing never suppresses a kidney hæmorrhage which will not stop spontaneously.

In cases of severe hæmorrhage transfusion of citrated blood undoubtedly renders immense service.

In the case of seton wounds the author thinks the indication is generally for abstention; also in cases where there is a retained projectile, because many projectiles retained in the kidney region, not necessarily in the kidney, are well tolerated, particularly if small; because many require a large opening up for their removal; and also because treatment of the supposed infected renal wound is hazardous if a partial nephrectomy is not done and there is often the temptation to do a total nephrectomy.

Only very large projectile fragments capable of being removed without extensive opening up appears to the author to be a motive for operation. Others may be left and removed later if they give rise to complications.

The author's experience and examination of old cases of kidney wounds show it a well established fact that a large number show no stigma which can be discovered by the most precise methods of functional tests. Such a fact should indicate conservation in the treatment of kidney wounds.

W. A. BRENNAN.

**Sargent, J. C.:** Chronic Non-Surgical Pyelitis; Its Etiology and Treatment. *Wisconsin M. J.*, 1918, xvi, 400.

Sargent has made a study of seventy-five cases examined and treated at the James Buchanan Brady Urological Institute of Johns Hopkins Hospital.



He says that recent experimental investigations and clinical studies have warranted the general belief that pelvic infections are usually if not always hæmatogenous in origin and that it is quite conceivable that a chronic pyelitis might be constantly kept up by organisms occurring in the urine as a result of a focal source of infection in the intestinal tract or elsewhere.

The author reports the case of a patient who suffered from a bilateral pyelitis dating back twenty years to an injury of the deep urethra. His entire treatment consisted of eighteen lavages, and there was no improvement until a traumatic pocket was found in the deep urethra from which pus was seen to escape. Following the cure of the infected pocket, the pyelitis reacted to lavages. This case seems to prove the relationship between a pyelitis and a focus of infection in the urethra.

Six of Sargent's cases of chronic pyelitis associated with a chronic prostatitis and seminal vesiculitis were cured of the pyelitis but not of the bladder infection. In all six cases the pyelitis recurred. He claims in these cases that the chronic infection of the prostate and seminal vesicles was the source of the organisms that produced the reinfection of the kidney pelvis. About one-third of his cases of chronic pyelitis were cured very easily and did not show any tendency toward recurrence.

Sargent's treatment of chronic pyelitis consists of repeated direct applications of some irritant antiseptic to the inflamed kidney pelvis. Silver nitrate has been given the preference because it is both irritating and antiseptic. The lavages should be repeated at intervals of a week or ten days until the ureteral urines have been found to be free from organisms. The injection should be of one per cent strength at the first sitting and, unless it is followed by a severe reaction, a two per cent solution should be used the second time.

The strength of solution is increased at each sitting until one has been used which produces an annoying but bearable amount of renal discomfort for a day following the lavage. Some patients cannot take a solution stronger than one per cent. Others will not experience a reaction until a five per cent solution has been used.

Hexamethylenamine is used as an adjunct in the catheterization treatment of chronic pyelitis. To be of any value, the urine must be rendered acid.

His conclusions are as follows: First, there is apparently some relation between the chronic infections of the kidney pelvis and a focal infection elsewhere in the body, usually some intestinal disturbance; less frequently an infection of the middle ear, the tonsils, or teeth. Second, chronic infections of the prostate and seminal vesicles are occasionally the source of organisms producing and supporting a chronic pyelitis. Third, in the treatment of chronic pyelitis a focal source of infection should be sought and if found, treated. Fourth, in the local treatment of chronic pyelitis, the solution of

silver nitrate should be used in sufficient strength to produce an annoying but bearable amount of renal discomfort.

LOUIS GROSS.

**Sellers, C. A.: Infections of the Urinary Tract in Infants and Younger Children Due to the *Bacillus Coli Communis*. *J. Indiana St. M. Ass.*, 1918, xi, 108.**

Sellers gives his results from a study of infections in infants and younger children due to the whole family of coli, and also from the information gained from a questionnaire sent to 600 physicians.

He lays particular stress on the examination of the urine as a means of diagnosis neglected by most physicians; and claims that pyelitis is simply a disease overlooked and one of the most probable causes of obscure fever.

His conclusions are as follows:

1. Acute pyelocystitis is being overlooked in infancy because of the neglect of a routine microscopical urinary examination in all cases.

2. While the condition is more frequent in female children, still there are many cases in males which have been overlooked.

3. The theory that acute pyelitis is always an ascending infection with the colon bacilli from the soiling of the vulva is losing its hold. The belief is justified that there is some other cause in which either the kidney resistance is below par or that there are conditions in the body fluids that increase the virulence of the colon bacillus.

4. Acute pyelitis is probably never primary.

5. The disease as a rule responds promptly to alkaline treatment, especially potassium citrate or guaiaacal through rendering the urine alkaline. Urotropin and vaccines are most disappointing, and their use in young infants is to be questioned.

LOUIS GROSS.

**Rowan, C. J.: A Summary in Symposium on Surgical Conditions of the Kidney. *J. Iowa St. M. Soc.*, 1918, viii, 49.**

Rowan considers especially worthy of emphasis three points:

1. The fact that most surgical conditions of the kidney are not diagnosed nearly as early as they should be.

2. The importance of careful microscopic urinalysis in obscure or atypical cases which seem to indicate a surgical intra-abdominal condition.

3. The inestimable value of the functional tests.

As examples of late diagnosis cases he cites hypernephroma, renal tuberculosis in some cases, and the procrastination resultant from symptoms of cystitis which in reality are kidney cases.

Under the second point, Rowan contends that more careful searches for blood, pus and bacteria by the microscopist will help to clear up many so-called cases of appendicitis and other vague diagnoses.

Functional tests, although only a link in the chain of diagnostic aids, are of much value. He



rightly warns however that they should be used only in conjunction with careful physical examination and observation and good surgical judgment.

H. W. E. WALTHER.

**Loeb, L.: Further Investigations on Auto- and Homoplastic Transplantation of Kidney Tissue.** *J. Med. Research*, 1918, xxxvii, 229.

In a series of studies it was the author's aim to analyze the factors determining the fate of transplanted tissue and especially to determine the cause of the difference in the behavior of tissue after auto- and homotransplantation.

As a step in this investigation Myer investigated previously the fate of kidney tissue transplanted into a pocket of the ear of the guinea-pig. There was reason to assume that the particular place of transplantation, namely, a pocket in the ear, had some influence on the fate of the transplanted tissue, and they decided therefore to resume this investigation and to study kidney tissue after transplantation into the subcutaneous tissue of the dorsal or anterior aspect of the abdominal wall. It was to be expected that if there should be any difference it would concern especially the later stages, and therefore they gave particular attention to these.

The author gives in great detail the results of a series of experiments. He found that the effect of auto- and homotransplantation depends, among other factors, upon the place of transplantation. In the former series of transplantation he used a pocket in the ear of the guinea-pig and found that under these conditions the destruction of the homotransplanted tissue was complete after the twenty-first day following transplantation, while the autotransplanted tissue suffered under the influence of ingrowing connective tissue, but was not yet quite destroyed at a period thirty-eight days after transplantation.

While in their first series it was clear that the number of lymphocytes was considerably greater in the homotransplanted than in the autotransplanted piece, this difference came out much more markedly in the new series. Occasionally some lymphocytes were found, either around the tubules or in the capillaries of a glomerulus in the autotransplanted piece. They were especially found at places where the connective tissue was increased around the tubules. But on the whole, they were either absent or present only in a very small number after autotransplantation.

It was different after homotransplantation; here they were a very prominent feature. They became distinctly noticeable nine days after transplantation and remained from then on a constant accompaniment of the transplanted tissue, usually increasing in quantity as the time progressed. They appeared at first around and in the peripheral zone of living kidney tissue; they collected in increasing numbers around the tubules, penetrated into the lumen of tubules and also into glomeruli. They isolated tubules from the surrounding tissue and

invaded and substituted the tubules at times. Thus they were a factor in the destruction of tubules; this destruction of tubules by lymphocytes was noticeable after the tenth day and persisted from then on. They also penetrated into the necrotic or organized center of the transplanted piece; however, they were present here in smaller numbers. At later times they were also found to fill almost completely capillaries which traversed the transplanted piece.

In both the autotransplanted as well as in the homotransplanted piece connective tissue was growing. It surrounded the tubules and glomeruli in the peripheral rim of living tissue, and proceeded into the central necrotic material. There was, as far as Loeb could judge, a greater ingrowth of fibroblasts between the tubules of the homoplastic than between those of the autoplasic piece. The distances between the living tubules were greater in the homotransplanted piece. The presence of large numbers of lymphocytes in the connective tissues made an accurate determination of the new-formed fibrous tissue difficult. All indication, however, pointed to the conclusion that the amount of connective tissue was actually greater in the homotransplanted piece. This was especially apparent in the second period in the time following the first two weeks after transplantation. In the autotransplanted piece the tubules often formed lobules of closely approximated tubules, bands of fibrous tissue separating the different lobules, while in the homotransplanted pieces there was more connective tissue around the individual tubules. Such strands of connective tissue around individual tubules were, however, not altogether absent in the case of the autotransplanted piece.

In both the auto- and homotransplanted pieces the peripheral zone of living tissue surrounded a central necrotic area. The size and character of this central area varied in different animals. At first they found here necrotic kidney tissue which stained pink with eosin, and in which the shrunken nuclei were still visible. The fibroblasts migrated then in the peripheral part of this necrotic material, first between the necrotic tubules, and later into the tubules. Phagocytes appeared which took up some of the necrotic material and as a result of this activity the pink-staining necrotic material was transformed into a hyaline material, which stained light or had a yellowish tinge as a result of admixed coloring matter derived from hæmoglobin, which either diffused into the necrotic center or which was distributed through phagocytes. Later the whole necrotic center was transformed into this lighter staining material. However, the organization of this material by connective tissue remained incomplete throughout the period of experimentation. The central necrotic tissue had become transformed under the influence of host cells, but it had not been completely substituted by them.

The tubules which composed the transplanted kidney tissue had a simple structure similar to those



of the collecting tubules of the kidney. The glomeruli, as far as they remained preserved, seemed to become smaller and more hyaline.

The author observed not rarely in the transplanted thyroid and also in the mammary gland of the mouse a coalescence of acini which thus formed larger cavities. The same occurrence was observed occasionally in the transplanted kidney tubules. As a result of degenerative changes, the separating walls disappeared and a small cyst was produced at times.

The fate of kidney tissue after auto- and homotransplantation was markedly influenced by the place of transplantation. Tissue transplanted into the ear of the guinea-pig was destroyed much more rapidly than tissue transplanted into the subcutaneous tissue elsewhere.

The main difference between auto- and homotransplanted pieces consisted in the lymphocytic reaction, which was much greater around the homotransplanted tissue. The lymphocytes actively participated in the destruction of homotransplanted tissue. This lymphocytic reaction seemed to be independent of the loss of weight of the animals during the period of the experiment. Furthermore, it did not seem to be noticeably influenced by the presence of bacterial infection at certain places of the transplant.

On the whole, the lymphocytic reactions showed a similar intensity and a similar time curve in the case of the kidney as in the case of the thyroid. If there was a difference, it was in favor of a greater intensity in the kidney.

Fibroblasts grew as well into the homoplastic as into the autoplasmic kidney tissue, but the amount of ingrowing connective tissue was, as far as could be determined, greater in the homoplastic tissue. The connective tissue seemed to participate in the destruction of tissue by exerting a pressure on certain parenchymatous structures.

In the kidney as well as in the thyroid an organization of the necrotic center took place after transplantation. The rapidity with which the organization took place, however, was greater in the case of the thyroid. The necrotic center of the kidney was more resistant to the organization. Under the influence of the ingrowing connective tissue cells and phagocytes, the necrotic material in the center became transformed from a substance staining red with eosin into a material pale and hyaline.

The curve of mitotic proliferation in the transplanted kidney tubules was definite. After the seventh day the intensity of proliferation began to decrease markedly and came almost or entirely to a standstill twenty-seven to thirty days after transplantation, although at that period the transplanted kidney tubule still lived under abnormal environmental conditions.

If there was a difference in the frequency of mitoses between the auto- and homoplastic pieces, it was in favor of the homotransplanted piece; and

especially those tubules were liable to show some mitoses which were in process of destruction by lymphocytes and connective tissue in the homotransplanted piece. The injury of the tubules seemed to constitute a secondary proliferative stimulus, leading to mitoses in the homoplastic pieces.

GEORGE E. BEILBY.

**Hunner, G. L.: Ureteral Stricture; a Report of 100 Cases.** *Bull. Johns Hopkins Hosp.*, 1918, xxix, 1.

This very comprehensive and most interesting report of ureteral stricture is based on the author's personal experience of 100 cases, although the general conclusions are based on an experience of over 150 cases.

After reviewing the various theories that have been advanced from time to time regarding the etiology of ureteral stricture, such as the congenital origin, gonorrhœa, inflammations, the influence of the trauma of labor, syphilis, and the possible relationship between infected cervical glands and stricture, the author has come to the belief that the majority of ureteral strictures, excluding those of tuberculous origin, have their origin in an infection carried to the walls of the ureter from some distant focus, such as diseased tonsils, sinuses, teeth, or the gastro-intestinal tract. This conception of stricture postulates that in the majority of cases ureteral infiltration is primary, and that the other urinary tract lesions so often associated with stricture, such as stone, hydronephrosis, pyelitis and pyonephrosis, are secondary.

The discussion of the symptoms is considered under the following headings:

1. Pain. According to the author, pain is the most universal symptom and only in rare cases is it absent. Since the author made his first report, based on fifty cases, he has studied his cases more carefully and obtained better histories, so that it is rare to find a patient with stricture who does not complain of a pain or of a nagging discomfort in the site of the ureteral inflammation. The pain may radiate toward the kidney, into the hips, groin or sacro-iliac joint, or over into the thigh and leg. Next in frequency to the local ureteral pain is pain in the kidney, probably referred at times, but usually due to an overdistended pelvis. Discomfort in the bladder and frequency of urination are not uncommon.

2. Urine examination. The urine may be quite negative. If there is an associated pyelitis, the urine shows the pathologic features and variations common to that condition.

3. Chills and fever. These are common in the cases with urinary infection.

4. Gastro-intestinal symptoms. These the author states are common, arising either as a central nervous system reflex or as a result of toxic absorption. The symptoms vary from a slight aversion to food to the most extreme nausea and vomiting. Rectal tenesmus may be present. Another symptom that may result from ureteral stricture is colitis.



5. Morbid anatomy. Hunner has had an opportunity to study the stricture macroscopically in about 15 cases, as a result of which he states that the inflammatory area varies from a slight annular thickening in the ureteral wall to a condition of diffuse cartilage-like thickening which may occupy several centimeters of ureter and form a mass a centimeter in diameter. Multiple annular strictures are not uncommon. Peri-ureteritis may be present. The microscopic picture (based on three cases) is one of chronic inflammation of all coats of the ureteral wall. The largest number of strictures were located in the broad ligament region, and the next most frequent location was at the bifurcation of the internal iliac vessels.

These locations are not in accord with the generally accepted view that ureteral stricture occurs at the points of congenital narrowing.

The effects of the stricture on the upper urinary tract the author believes to be in the following sequence: focal infection settling in the wall of the ureter, stricture formation, stasis and secondary infection. The author states further that although it is believed to have been demonstrated that most cases of dilatation of the kidney pelvis are due to mechanical obstruction in the form of ureteral stricture, a surprising development has been the fact that many cases of ureteral stricture causing typical symptoms are not associated with a dilated pelvis, and when the pelvis is not dilated, it is often contracted.

Pyelo-ureterograms in some of the cases showed the ureter contracted as well as the pelvis, and in others the pelvis was contracted and the ureter slightly dilated.

For the purpose of discussing the presence of infections, the author divides them into two groups. In the first 50 cases there was a bacteriological report in 27 cases, of which 9, or 33 1/3 per cent, were sterile. In the 18 infected cases the colon bacillus was obtained in 13 cases, in 4 cases a staphylococcus was grown, and in 1 case a pure culture of typhoid was obtained.

In the second group of 50 cases all were studied bacteriologically. In 11 cases infection was present, 8 with the colon bacillus, 1 with a staphylococcus, 1 with a streptococcus, and 1 with an unidentified organism. In four cases the infection was bilateral.

Regarding the influence of ureteral stricture on stone formation, the author believes that at present there is abundant evidence to indicate that the stone results from urinary salts being deposited in the inflamed surface of the stricture area. He furthermore states that there can be no doubt that an occasional stone formed in the kidney is caught in a normal ureter. On the other hand, he believes that some stones found in the kidney were originally formed on the site of a ureteral stricture and after sufficient dilatation of the tract above, these stones float up into the kidney and increase in size.

As to the influence of stricture on the pyelitis of pregnancy and the puerperium, he believes that

the stricture is probably present before the pregnancy in most of the cases, and the added congestion of the tissues after conception sets up a slight hydro-nephrosis which becomes infected during or immediately after pregnancy.

The diagnosis of ureteral stricture is based on the history, urinary examination, palpation of the abdomen with special reference to the kidney and ureter regions, palpation of the ureter through the vagina or rectum, cystoscopy, catheterization of the ureters by specially prepared catheters and roentgenography. The crucial test in diagnosing stricture is made with the wax-bulbed catheter. The author does not consider obstruction to an entering catheter as diagnostic of ureteral stricture, while he considers repeated obstruction at the same point as being suggestive; for a positive diagnosis he depends entirely upon the obstruction or "hang" of the wax bulb on withdrawal.

The use of pyelo-ureterograms as a rule is not necessary. Formerly the author refused to use the roentgen ray in making his diagnoses; he now uses it in most cases for the satisfaction of its confirmatory value.

The various lesions that must be considered in the differential diagnosis are briefly discussed; these embrace the urinary tract, genital tract, gastrointestinal tract, various joint and nerve lesions and mental disorders.

The treatment is considered under two headings, non-operative and operative.

The author is to be commended for his strong stand favoring the treatment of ureteral stricture by means of non-cutting measures, for he states that "the ideal treatment for stricture of the ureter is by dilatation from the vesical approach." As a rule, the author uses the olive-tipped catheter, carrying a wax bulb 8 to 10 cm. from the wax-tipped end. The whistle tip catheter of Garceau may also be used. If these catheters fail, one may resort to the use of the metal searcher.

The bulbs which the author used are made of pure beeswax, which he says is soft enough to get an impression of a stone and firm enough to hang to the catheter.

At times one may fail to enter the stricture with the above methods, in which instance the first dilatation may be obtained by using whalebone filiform searchers.

The author warns against investigating or treating a stricture too frequently, and also against using the bulbs too large, as this may result in trauma of the ureteral mucosa; nor should too much force be used in pushing the catheter in.

Distant foci of infection should be treated at the same time.

Under certain circumstances all methods of vesical approach may fail, so that one may be obliged to resort to operative measures which, however, should not be undertaken until a complete examination of both sides has been made.

If investigation reveals stricture of one ureter



associated with a kidney of little or no functional value, the kidney should be removed.

In strictures high up, some sort of pyelo-ureteroplasty, as recommended by Fenger, may be justified. In some instances of valve-like obstruction, the condition may be relieved by simple fixation of the kidney. When the narrowing is found at the pyelo-ureteral junction, a pyelotomy and dilatation may be done in addition to the kidney fixation.

The author recommends for use in some of the cases retrograde dilatation, that is, by first exposing the ureter extraperitoneally, incising the dilated ureter above the stricture and then passing bougies or metal sounds.

H. L. KRETSCHMER.

### BLADDER, URETHRA, AND PENIS

**Escat, J.: Treatment of Wounds of the Bladder and Urethra** (Traitement des plaies de la vessie et de l'urètre). *J. d'urolog.*, Par., 1918, vii, 161.

Among 140 war wounds of the genito-urinary apparatus treated in Escat's special urological center since March, 1915, there were 26 bladder and urethral wounds which were about six and seven months old when received.

Generally bladder wounds are associated with other injuries; in only 8 of the 26 was the bladder the only organ injured. In all of the cases there were pubic fractures and in several cases the intestines had been perforated. Usually a sacral fracture was not observed; lesions of the anterior pelvic girdle being predominant, giving rise to an osseous fistula in addition to the urinary fistula. The association of these two lesions, with occasionally involvement of the intestine, furnishes obvious general indications for early and thorough treatment.

In 20 of these cases no special operation had been done. Escat thinks that while there were probably good reasons for this at the front formations, there appear no sufficient reasons why such lesions, in many cases with a foreign body in the bladder, should have been left for several months in the base hospitals without adequate operations which would have prevented aggravation and hastened repair.

The great value of an early cystostomy in complicated wounds of this kind is that it furnishes at once a means of diagnosis and treatment. It not only permits the removal of foreign bodies but also action on bone lesions opening into the bladder.

The author points out the very great value of early systematic radiography of the pelvis to discover the extent and situation of bone lesions.

Pubic bone lesions call for a careful toilet of the area and the creation of counteropenings so as to avoid osseous intravesical fistulae. Immediate and blind drainage of wounds communicating with the bladder cannot give the same security as the regular drainage of this organ. The question of proper drainage needs very special early attention. Drainage of the bladder by regular cystostomy, clearing of the area around a pubic fracture, and careful toilet of the bone are sufficient for a rapid recovery.

An immediate or very early cystostomy allows continuous drainage of the sources of infection and of the fistulae; it obviates immediate or end complications by the removal of foreign bodies; rapid cicatrization is effected in simple and complicated cases. Deviation by an iliac anus in cases of vesico-intestinal perforation is useless in the majority of cases and has only very limited indications. Postoperative care and the maintenance of the cystostomy are as important as early operation.

The 37 cases of urethral wounds treated were on an average of seven months old. The primary treatment had been as follows: in 18 cases simple dressings only, no operation; in 4 cases, either perineal drainage or by the wound; 13 cases were treated by repair of the urethra; 12 cases were treated by hypogastric deviation of the urine, in 7 of which there was a cystostomy. In general the immediate results of all these treatments were good but the end-results were poor. No matter what treatment was employed, all wounds of the anterior urethra have been followed by traumatic stricture and frequently by fistulae of various degrees. The author draws attention to the absolute necessity of long postoperative attention to the complications arising in urethral wounds.

The study of the cases leads the author to conclude that traumatism of the urethra should be primarily operated upon in two stages. The first immediate operation should be directed against retention and infection, consisting of a hypogastric deviation of the urine and preparation of the tissues by wide and methodical urethroperineal excisions. The later operation should effect reparation either by urethrorrhaphy or autoplastics, the deviation of the urine being still continued as before. The efficacy of these procedures depends on the continuance of special postoperative care in the urological centers.

W. A. BRENNAN.

**Cathelin, F.: Surgical Treatment of Non-Fistulous Strictures of the Scrotoperineal Urethra Following War Wounds** (Traitement chirurgical des rétrécissements de l'urètre non-fistuleux scrotopérinéaux suite de blessures de guerre). *Progrès méd.*, Par., 1918, p. 66.

Cathelin draws attention to the many occasions in which an injury or interruption of the scrotoperineal urethra justifies the army surgeon in opening the bladder suprapubically for drainage. Many cases of subcutaneous rupture of the scrotoperineal urethra either with or without suprapubic incision having been done, as referred to, reach the author's reparatory urological clinic.

In making an urethral repair operation, typical urethrectomy cannot be applied in these war cases owing to the perineal disorder and the difficulty of finding the separated ends of the urethral tube.

Since 1916 Cathelin has devised a technique by retrograde catheterization of the urethra from the bladder and direct through the meatus. After thus identifying the two ends of the urethra he

approximates them and makes a canal through the new-formed tissue between the two ends which have been anchored. The previous opening of the bladder facilitates the operation, which occupies only a few minutes. The bladder is kept open for at least a month and a retention catheter kept in place in the new canal until on cicatrization the latter is found to be complete. The bladder opening is then closed.

In a few cases recently operated upon by Cathelin, the newly made canal has remained in excellent condition up to the time the patients left the hospital. One of these patients had had a typical urethrectomy with circular urethrorrhaphy without any success even with suprapubic drainage. The anatomic results of these new-formed perineal canals and the action of the urethral mucosa in connection with it are matters for the future to show. It is well to dilate the canal with sounds occasionally.

W. A. BRENNAN.

### MISCELLANEOUS

**Wolfer, J. A.: Urinary Extravasation.** *Surg., Gynec. & Obst.*, 1918, xxvi, 296.

Urinary extravasation is a complication of many pathological processes of the urinary tract. It may be compared to perforative peritonitis in diseases within the peritoneal cavity.

Normal sterile urine is absorbed with no local lesion, as shown by experimental guinea-pig inoculation, but produces necrosis when marked pressure is produced, not unlike the action of water or salt solution in this respect; however, septic urine is very toxic, producing œdema, necrosis and sloughing, regardless of the pressure under which it is placed.

Twelve cases reported by Wolfer are divided into two groups: (1) extravasation of normal urine, where there has previously been no stenosis of the outlet. The causative factor is trauma. Acute local disturbance and sepsis appear only after pressure necrosis begins. These patients may spontaneously recover by the closure of the perforation, but cases often terminate fatally if sepsis intervenes. The operative results are uniformly good, if performed before necrosis has taken place, by closure of the perforation with drainage; (2) extravasation of septic urine, which is practically

always associated with urethral stricture; this group constitutes the vast majority of such patients.

Infection sooner or later is produced proximal to urethral stricture resulting in granulation production and tortuosity of the canal with pocket formations; the bladder wall becomes thickened and fibrous, and loses its elasticity. Complicating pathology such as prostatitis, seminal vesiculitis, and peri-urethral abscess is often seen.

Causes of extravasation with stricture are:

1. Stricture of the urethra with retention followed by suprapubic puncture. This often results in extravasation through the trocar opening of septic urine, and a fatal result ensues. Suprapubic puncture may be done if a fine catheter is left in place and further drainage of the bladder instituted within a few hours.

2. Stricture of the urethra, with perforation by an instrument. The superficial perineal fascia and the triangular ligaments divide the perineum into two more or less closed compartments. Instruments usually perforate at the membranous urethra, causing extravasation into the deep space behind the triangular ligament. Here the urine must perforate the triangular ligament and appear in the anterior compartment or it becomes perivesical in the space of Retzius. Suprapubic cystotomy and incisions laterally in the perineum down to the deep compartment are all that is required; the urethral stricture must be treated later. If untreated, early gangrene takes place in the deep structures and soon appears superficially. Wolfer strongly suggests that the best method of treatment now is suprapubic drainage with wide drainage of the infiltrated areas, avoiding the urethra which is to be treated by means of sounds and filiforms from the suprapubic opening. He allows the suprapubic opening to close only after the urethra has been dilated to admit a 30 French sound.

3. Stricture of the urethra with perforation due to infection. The onset is often accompanied by a chill, severe shock supervenes, and rapid disintegration of the tissues results; death often follows. Findings simulating a deep peri-urethral abscess, together with the above symptoms, should suggest the diagnosis in most instances.

The treatment is exactly similar to that for extravasation following instrumental perforation.

HARRY CULVER.



# SURGERY OF THE EYE AND EAR

## EYE

**Pierson, P. H.: Tuberculosis of the Eye.** *Calif. St. J. Med.*, 1918, xvi, 74.

The lymphatics and blood supply of the eye, which are generally the methods of infection with and spread of tuberculosis, are described, the manifestations and differential diagnosis of tubercular lesions are considered, and a plea made for the more frequent use of tuberculin in diagnosis and treatment of eye disease, which is stated to be as specific for tuberculosis as the Wassermann test is for syphilis.

A general reaction is not enough; to consider the test positive, a change should take place in the eye itself and after each injection the eye lesion should be examined as regularly as the temperature chart. The reaction may take the form of hæmorrhage; Axenfeld and Stock found that hæmorrhages into the vitreous which commonly accompany retinitis proliferans were often due to tuberculosis.

Endeavor should be made to use the smallest dose that will produce a reaction; if recurrences take place or relapses occur, another kind of tuberculin may be tried with value.

Treatment should be general as well as with tuberculin.

S. S. Howe.

**Gibson, W. S.: The Etiology of Phlyctenular Conjunctivitis.** *Am. J. Dis. Child.*, 1918, xv, 81.

Gibson presents an exhaustive clinical, experimental, and pathological study of the etiology of phlyctenular conjunctivitis. While this disease manifests itself as a local condition in the eye, it has long been recognized by both ophthalmologists and pediatricians that there is some underlying systemic condition. Nearly all of the work, if one may so designate a large part of the speculation that has been indulged in on this subject, has been done by ophthalmologists whose fitness for studying a fundamentally pediatric problem has naturally been limited. Gibson has approached the subject from the pediatric standpoint, and this gives his work a peculiar value.

Ninety-two consecutive cases, nearly all diagnosed and referred from the associated eye clinic of Brown Pusey, were studied intensively with reference to all of the theories that have been advanced as to the etiology of this disease. These included bacterial infection from without, exposure to wind and dust, errors of refraction, herpes, eczema, pediculosis, diseased tonsils and adenoids, intranasal conditions, gastro-intestinal disturbances, auto-intoxication, impairment of general health, bad living conditions, scrofula, the exudative diathesis, and tuberculosis.

A complete history of each case was obtained, the patient examined from every angle, and in a large consecutive number of cases the home conditions, the blood, and the urine were investigated. With the exception of tuberculosis, no one of these conditions either local or general could be found with sufficient frequency even to suggest any direct influence in producing the disease. On the other hand, 90 of the 92 cases gave a positive Von Pirquet reaction, and in the two negative cases the diagnosis was frankly questionable. In other words, while only a fraction of the cases showed clinical lesions of tuberculosis, practically all of them had tuberculosis as shown by the Von Pirquet test, whereas only about 25 per cent of all children of like age and under like conditions give a positive reaction.

A large number of experiments were conducted on healthy and previously tubercularized rabbits aiming to produce phlyctenules by the use of tuberculin subcutaneously; by merely tubercularizing the rabbits; by instilling tuberculin and staphylococcus vaccine into the eyes of both healthy and tuberculous rabbits; and by subconjunctival injections of tuberculin. In no case did phlyctenules occur in the eye of a healthy rabbit, while in those that had previously been made tuberculous 8 showed typical phlyctenules; they occurred six times as a complication of a conjunctival reaction resulting from the instillation of tuberculin, and twice in the absence of any local irritation of any kind. Clinically these phlyctenules were identical with these occurring spontaneously in the human eye; pathologically they resembled them closely. The microscopic findings suggested a tuberculous origin.

Gibson concludes his summary with the statement: "All clinical, experimental and pathologic evidence points to tuberculosis, and tuberculosis alone, as the cause of phlyctenular disease." Five excellent microphotographs of experimental phlyctenules occurring in tuberculous rabbits both spontaneously and at the height of a conjunctival reaction resulting from the instillation of tuberculin, and one of the adjacent limbus are included in the paper.

JOSEPH BRENNEMANN.

**Bonnefon: A Study of Corneal Grafts** (*Étude des greffes cornéennes*). *Lyon chirurg.*, 1917, xiv, 903.

The author's experimental work has demonstrated that experimental corneal grafts have given wonderful results as regards transparency in the animals experimented on. Nevertheless, these results, apparently so favorable as regards the survival of transplanted tissue, do not hold when applied clinically; and the author has concluded after hundreds of attempts that it is impossible to practically apply corneal grafting in human subjects.

The author discusses the development of auto- and heteroplastic grafts, both biologically and clinically. The results as found by histologic study are the same in all cases, i.e.: (1) massive necrosis of the conjunctive cellular elements of the graft; (2) an active fibroblastic proliferation; this fusiform cell proceeds from the host and penetrates the graft; (3) the epithelial coat of the graft alone definitely preserves its vitality and its cellular characteristics. These facts were observed in the animal experiments. The histologic examinations have shown a complete degeneration of the graft with the exception of the epithelial coat. The grafts are always substituted and regenerated by fibroblasts from the cornea of the host, and the graft thus loses its physiologic identity excepting the epithelial coat.

The facts demonstrated explain the conflicting results obtained in experimental and clinical keratoplasty. The experimental grafts are successful because they are regenerated from the surrounding transparent cornea, whereas clinical grafts fail because they are placed in degenerate cicatricial tissue.

The author calls attention to the biologic indications of these results and to the necessity of constant histologic examination as the only source of knowledge of the ultimate survival of a graft.

W. A. BRENNAN.

**Higgins, C.: A Case of Spontaneous Cure of Cataract.** *Lancet*, Lond., 1918, cxciv, 296.

The patient, aged 73, had had repeated attacks of iritis in both eyes. About forty years ago he developed cataract of both eyes, the right being worse; this was operated upon with good result. For years the vision in the left eye was such that he could only tell light from dark.

In the left eye, which he believed to have a cataract, there was a deep anterior chamber, tremulous iritis, a small central pupil but no sign of cataract. The lens was obviously dislocated and floated across the pupillary area on movements of the globe. There was no history of injury to the eye, but about ten years before, the patient had had a severe fall on the back of his head, and the author is inclined to believe that was the cause of the dislocation.

V. C. HUNT.

**Chance, B.: A Case of Cavernous Angioma of the Orbit.** *Ann. Ophth.*, 1917, xxvi, 547.

The patient was a girl of sixteen in whom the tumor was noticed soon after birth. It had gradually increased in size until it occupied the upper half of the left orbit and extended from one lateral rectus to the other, forward into the lid, and backward indefinitely. There was enlargement on elevation of blood-pressure, as in stooping, and when the upper lid was raised the purplish mass protruded like an enormous staphyloma of the sclera. The mass was accommodated by an absence of the orbital ridge in the middle third and by deficiencies

in the external orbital wall and the roof of the orbit. The cornea was unaffected, the fundus healthy, and the skin of the body was entirely free from angiomas.

Dissection showed the tumor to be encapsulated with fibrous bands penetrating the capsule from the growth. It rested on the upper and outer aspects of the globe and was quite adherent to the sclera. Removal was accompanied by great loss of blood.

Histologic examination showed the tumor to have the character of erectile tissue, the spaces being lined with endothelium and having fibrous walls, many fields showing striated and unstriated muscle fibers.

A study of the sections gave no clue as to the probable origin of the angioma. The operative results, while not entirely satisfactory, left a vision of 6:30.

S. S. HOWE.

## EAR

**Brownfield, R. R.: Detection of Pretended Loss of Hearing, with Special Reference to Unilateral Deafness.** *J. Am. M. Ass.*, 1918, lxx, 597.

In the author's device, batteries and make-and-break contacts are entirely dispensed with. The ordinary 110 volt alternating commercial lighting current is used. The variable current is produced by a potentiometer, and is variable from an absolute zero to maximum. No vibrating iron is used, and the maximum strength of the current employed is dependent on no factor except the ratio of the electrical resistances employed. The sound producer is similar to a telephone receiver except in one very important respect, i.e., the core is of soft iron and is not magnetized. This results in eliminating the variability due to demagnetization, and doubles the pitch, so that the ordinary 60 cycle current produces 240 vibrations per second, about equal to the average tone used in conversation.

The sound producer is provided with three lugs to hold it away from the ear so that the sound will be transmitted solely by air conduction. By simply turning the indicator from 100 to zero, one can cause the sound to increase from the point at which it is just perceptible to one of normal hearing, the threshold of audition, or 100 per cent acuity, to a degree of intensity at which failure to perceive it indicates that the subject has no practical hearing. In addition to the variable receiver, there is a supplementary one that always operates at maximum intensity, irrespective of the loudness of the other.

In the usual test for the acuity of hearing, only the variable receiver is used. As the subject holds this to the ear, the pointer is gradually moved from zero to the 100 point. As the intensity of the sound gradually decreases, he is told to indicate the point at which he is no longer able to perceive it. This point is noted, and the movement of the pointer continued still farther. The direction is then reversed and the subject directed to indicate



the point at which the sound is again heard. After one or two trials, the various readings will be found to harmonize quite closely unless one has a case of malingering, which may be readily detected by inconsistency of the readings. It is hardly necessary to remark that the electric control has a distinct advantage over the watch and whisper tests, as the malingerer is totally unable to guess what reply would be expected from one of defective hearing. The only precaution necessary is to place the instrument back of him. A small push button is provided which may be used to disconnect the receiver, in case the subject is uncertain whether he hears the vibrations or is confusing it with tinnitus.

The application of the instrument consists in having the patient hold the constantly loud receiver over the alleged deaf ear, and the variable receiver over the other. Starting with the pointer at 100 (minimum sound), it is gradually moved toward zero and the subject directed to state when he first hears the sound in his good ear. If he really suffers complete loss of hearing in one ear, as claimed, the presence of the loud receiver will not disturb him or interfere with the perception of sound by the other ear; in fact, it might just as well be disconnected. Under this presumption he would have no difficulty in clearly detecting the sound in the other ear, and one would soon have a proper index of its acuity. If, however, he is merely pretending and actually has a very fair degree of hearing in both ears, it would be absolutely impossible for him to identify any sound whatever in his good ear to which the variable receiver is applied until a point on the scale is reached that would normally indicate very defective or almost no hearing for the good ear.

The very nature of the test facilitates the detection of fraud, because the better he can hear in the alleged defective ear, the less will he hear in the other, a condition just the opposite of what he might

expect; and so when he makes his usual negative reply, he is for once telling the truth and trapping himself.

OTTO M. ROTT.

**Rott, O. M.: The Clinical Interpretation of Labyrinthine Phenomena in the Presence of Suppurative Inflammation of the Middle Ear.**  
*Northwest Med.*, 1918, xvii, 56.

In the presence of spontaneous labyrinthine phenomena, the decision concerning the advisability of a mastoid operation rests largely on the question as to whether the type is a paralabyrinthitis or an acute diffuse labyrinthitis, and if the latter, whether there are or are not symptoms of meningeal involvement. If, for instance, during the course of a suppurative inflammation of the middle ear, the patient should complain of vertigo, nausea and vomiting, and an examination of the eyes revealed the presence of a nystagmus toward the diseased ear, with deafness not absolute, the condition would be a paralabyrinthitis and the best treatment would be the prompt opening of the mastoid.

If, on the other hand, there was absolute deafness of the suppurating ear, with the nystagmus directed toward the well ear, the condition would be one of diffuse labyrinthitis and the best interests of the patient would be served if one refrained from opening the mastoid during the acute stage, unless there are unmistakable evidences of beginning meningeal involvement, as determined by a temperature of over a hundred degrees, headache, photophobia, exaggerated reflexes, a positive Kernig, and positive findings in the cerebrospinal fluid.

Before undertaking a mastoid operation in chronic suppurative otitis media, the labyrinth should be tested and if found non-functionating, it would be safer to follow the mastoid operation immediately by a labyrinthine exenteration rather than to perform the mastoid operation alone.

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# INTERNATIONAL ABSTRACT OF SURGERY

AUGUST, 1918

## COLLECTIVE REVIEW

### WAR INJURIES OF THE FACE AND JAWS

BY MAJOR ROBERT H. IVY, M.R.C., WASHINGTON, D. C.

THE common occurrence of injuries of the face and jaw-bones during the present war has emphasized the importance of the close association of the surgeon with the dentist in the treatment of these cases, which attract particular attention by reason of the disfigurement which they cause. The special difficulties encountered in their treatment and which differentiated them somewhat from other war injuries arose from the attitude which regarded dentistry and surgery as two distinct and separate professions. The surgeon is not technically trained to splint fractures of the jaw-bones, yet early proper fixation is one of the most important points of the treatment. The dentist as such is not trained to care for the wounded tissue beyond fixation of the bones, yet repair of the soft tissues and proper drainage may be equally important.

#### EARLY CARE OF FACE AND JAW INJURIES

The earlier literature of these injuries in the present war shows the great ingenuity manifested in devising fixation and corrective appliances for overcoming deformities that were in part due to lack of early treatment. As the means for handling these cases became better organized, attention was directed more to the surgical side of this special problem until at the present time the established principles of surgery and trend of thought of practically all workers lead to the conclusion that a definite plan of treatment for face and jaw injuries should be initiated at the earliest possible moment after the receipt of the injury.

The general organization of the surgical service

and technical detail for early treatment of large numbers of wounded is perhaps best described by Duval (21), an ardent advocate of primary suture of wounds. An abstract of Duval's article is found in the *Review of War Surgery and Medicine*, April, 1918, page 15, prepared in the Office of the Surgeon General of the United States Army.

Frison and Brunet (30) call attention to the bad effects of delaying treatment of face and jaw injuries until they reach special centers in the interior. Under these conditions, the wounded arrived at the base with fractures of the jaws that had been left to themselves for weeks, and united in bad position with the formation of cicatricial bands, or even with pseudarthroses of the mandible which threatened to be permanent. It became necessary to undertake long and laborious treatment often with unsatisfactory results, in order to restore these badly deformed faces and to re-establish the physiological movements indispensable for mastication. These authors insist on the utility of centers of maxillo-facial prosthesis in the army zone. The indispensable personnel of such a center is a surgeon, specializing in the surgery of the face and neck, collaborating very closely with dental prosthetists.

Two categories of wounded should in the authors' opinion be kept in the centers of the army zone. In the first are classified those with extensive wounds of the face and neck who are not fit to be moved, those in danger of incurring a quickly fatal hæmorrhage, and those with concomitant severe injuries of other parts of the body. The second class is represented by light



wounds with simple fractures of the jaws accompanied by more or less displacement or loss of substance. Patients so wounded are capable of soon rejoining their regiments, after having been kept in the hospital the shortest possible time. The number of these wounded who can be retained near the front depends largely upon the total number to be taken care of, which is in proportion to the activity of military operations.

Under the proposed plan of early special treatment, the fractures are easily reduced, permitting the placing in the mouth of a fixation appliance with the teeth in normal occlusion. This fixation is followed by a disappearance of the pain previously incurred by the slightest movement of swallowing, speech, coughing, or blowing the nose. The patient is able to feed himself, which was previously almost impossible. This is also the best preventive treatment of immediate hæmorrhage caused by injury to the vessels, or of late hæmorrhage from ulceration of the vessels by sharp edges of bone. In addition, the supuration and the infection generally present show a very appreciable diminution after the immobilization of the fragments has been brought about. Finally, it is shown that the earlier the prosthetic intervention, the earlier the consolidation in good position. Under these conditions, the wounded will have been absent from their regiments the shortest time possible.

Trotter (89), in advocating systematic operative treatment of gunshot wounds of the mandible, states that attention hitherto has perhaps tended too exclusively to be concentrated on the fixation of the fractured ends of bone. It is clear that when there has been a large loss of bone substance, no amount of fixation can lead to reconstitution of the bone, and that it is toward the latter purpose that all treatment must be directed. If, by fixation, displacement of the fragments can be prevented until reconstitution can be undertaken, so much the better, but the reconstitution must be regarded as the essential purpose and nothing be allowed to prejudice it. The prevention of displacement is certainly less important than the attainment of sound union of the re-formed jaw, and there can be no doubt that if there is any clash of interests between the two objects, a strong and solid bone, even if somewhat deformed, is worth a good deal more than an insecurely united but shapely one. The primary and immediate operation giving full access to the fracture with the purpose of limiting hæmorrhage, sepsis, and necrosis, and attaining a limited and relatively aseptic scar, is an indispensable preliminary to a systematic application

of bone surgery to large destructive lesions of the mandible.

Valadier and Whale (90) believe in the early closure of the soft tissues, by flaps if necessary, at the same time preserving the original contour of the bone by means of splints, building out with dental modeling composition, etc. The following principles are formulated: (a) All remaining teeth should be preserved as far as possible, as they may prove useful in providing support for interdental splints. Teeth directly in the line of fracture should be removed, but more conservatism should be observed in regard to the teeth than is usual. (b) In extensive injuries of the face, the wounds should be closed as soon as possible; if necessary, before placing the jaws in position. The wound should be closed long before it is thoroughly clean. Two layers of sutures, one deep and one superficial, are used. Drainage of the mouth should be obtained by a median submaxillary stab wound into which a rubber tube is inserted. Where there has been a loss of tissue in the upper or lower lip, however, it is unwise to draw the edges together. (c) Where the initial closure of the soft parts precedes the orthodontal correction, there is a strong tendency for the soft parts to shrink into cicatrization. This renders work on the jaw itself difficult or impossible; and to prevent it, interdental appliances, to which wire has been attached for the grasping of modeling composition, must be inserted in order to preserve the contour. (d) Superficial sutures must not be subjected to undue tension, even if complete apposition of the wound edges is not obtained.

Nearly all authors agree that it is particularly essential that no loose fragments of bone be removed from the site of the fracture, as in many cases pieces of bone apparently hopelessly injured will recover their vitality and serve as a valuable matrix for repair (Kazanjan, 51).

#### FRACTURES OF THE LOWER JAW

These are classified according to the seat of the lesion (symphysis, body, ascending ramus, condyloid and coronoid processes), and also according to whether or not there is loss of substance. Two schools of practice may be recognized in the handling of cases with loss of substance: (a) that which considers that consolidation of the fracture should be assured by drawing together the ends of the bone even at the sacrifice of the normal occlusion of the teeth; and (b) a group to which the majority of workers belong, who believe that the re-establishment of the normal occlusion of the teeth is the primary consideration.

The principal supporters of the first plan are Imbert and Réal (49), and Colyer (12). They consider that it is more important to thus avoid unstable fibrous union and pseudarthrosis, necessitating later bone and cartilage grafting, than to have an ideally shaped bone which is unable to bear the stress of mastication. They believe that the shrinkage of the jaw which results from this procedure is of minor importance, even where there has been a loss of continuity amounting to as much as two and one-half or three centimeters. In Bennett's opinion (2), on the other hand the cases in which it is desirable to sacrifice contour and occlusion in order to obtain bony union are comparatively few, and almost limited to a particular class.

It may fairly be said that when normal position has been sacrificed to only a small extent, bony union could usually have been obtained without such sacrifice; and that where by such means bony union is obtained that would otherwise have been unobtainable, then the contraction is so great that the jaw is less useful than would be obtained by firm fibrous union in good position. In cases of unilateral fracture of the region of the angle, however, the approximation of the fractured ends, by allowing the posterior fragment to swing forward, even where there is considerable loss of substance, often materially assists bony union and does not cause loss of occlusion of any moment. Externally there is little visible defect beyond a diminution of prominence of the angle of the jaw. It may be desirable to extract an upper molar to permit of this movement. In fractures anterior to the first molar, this method of treatment involves a shortening of the alveolar arch on the affected side, and it is questionable how far the forward movement should be permitted.

#### METHODS OF FIXATION

Immobilization of the fragments should be carried out as early as possible in order to avoid fibrous union in false position requiring later corrective measures. Several forms of temporary splints have been devised, to be attached to the teeth by means of modeling composition (Pickering, 74). When the time comes for the application of permanent fixation, if reduction is resisted by newly formed scar tissue or callus, surgical division of the scar tissue or callus is indicated, followed by immediate fixation of the fragments in correct position. This is preferable to slow reduction by different complicated apparatus requiring weeks or months to bring about results uncertain in the end (Herpin, 41; Cole and Bubb, 11).

A very large number of papers have been written dealing with the classification and special methods of fixation of gunshot fractures of the jaws. That of Herpin (37) is particularly illuminating in regard to the anatomical considerations and their bearing on displacements in fractures of the mandible. Where there is loss of substance at the symphysis, the fragments tend to be drawn together in front with the occlusal surfaces of the teeth facing inward toward each other. In the lateral portion of the bone, the loss of substance causes the large fragment to be drawn over to the affected side. In fracture of the ascending ramus or angle, the ramus is usually drawn upward, inward and forward and the large fragment at its posterior extremity is brought backward and upward. Nearly all authors are agreed that the correct occlusion of the lower teeth with the upper should always be the guide in fixation of the fragments, even though this entails considerable separation between the fractured ends. The form of fixation to be applied depends upon the location of the fracture, the amount of substance lost, the amount of displacement, the number, condition, and position of teeth present. Among the most instructive papers bearing on this question are those of Colyer (12), Frey (28), Hayes (36), Herpin (38, 41, 42), Kazanjian (50, 51), Pont (81), Schroeder (84), Roy and Martinier (82).

The majority of gunshot fractures of the lower jaw involve the body of the bone anterior to the last existing tooth, and are characterized by considerable displacement and loss of substance. The best method of maintaining separation and fixing the fragments in their normal position in relation to the upper teeth in these cases is by the metal band and wire splint, consisting of a stout wire spanning the gap, attached by crowns or bands to sound teeth on either side. These splints can be made either in one solid piece or applied in sections, afterward fastened together (Kazanjian). For fractures behind the last existing tooth, Kazanjian favors treatment by means of a swaged metal splint covering the upper and lower teeth holding the jaws in occlusion, or intermaxillary ligation through the attachments afforded by metal or band and wire splints. In cases where there is a tendency to deviation of the jaw to the affected side and it is desirable to preserve the jaw movement, correct occlusion may be retained by means of inclined planes or interlocking flanges so placed as to guide the jaws into correct position.

Herpin (38) believes that the function of mastication should be retained during the treat-



ment of fractures of the angle or ascending ramus. In these cases he uses a metal bridge fastened to the lower teeth anteriorly with a vulcanite saddle passing back from this embracing the anterior border of the ramus, fixing the latter and preventing it from swinging forward. For fractures of the upper jaw, Kazanjian employs a modified Kingsley bar splint, attached with straps to the vertex of the skull. In cases with much loss or comminution of bone between the palate and the base of the skull, the proper distance of the upper dental arch and the base of the skull is maintained by means of a rigid bar passing from a swaged metallic cap cemented on the upper teeth to a head band. These head bands used in fixation of fractures are also useful as means of attachment for vulcanized rubber pads intended to support the wounded soft parts of the face by making pressure at desired points. Schroeder (84) for fixation of gunshot fractures of the jaws relies principally upon wire arches attached to the teeth by means of clamp bands.

The articles by Hayes (36) consist of a most instructive series of case reports from the American Ambulance in Paris. They are particularly valuable on account of the illustrations. It is notable that practically no reliance is placed on methods of external fixation by any of the authors, and direct fixation of the bones by plating or wiring is almost universally condemned. What he refers to as "postlevator" fractures of the mandible are given special attention by Villain (91, 92). These are fractures situated behind the insertions of the levator muscles, i.e., in the condyloid process, and may or may not involve the mandibular articulation. The only muscle attached to the jaw within the limits of this territory and which therefore does not act on the larger fragment is the external pterygoid.

The clinical signs of these fractures are more or less accentuated according to the extent of the lesion and the loss of substance; they include: pain in the temporomaxillary region on digital pressure and during mandibular movements, especially during closure of the mouth; inability to protrude the jaw, distolateral displacement, tendency to vertical displacement, and oblique opening of the mouth toward the fractured side. Crepitus can only be detected in thin subjects by direct contact of the finger on the fracture, and when there is no loss of substance. There is very little swelling and induration of the skin if the fracture is closed or not infected; otherwise oedema and induration of the temporomaxillary region are present. Trismus is established early and soon may develop into a stubborn contrac-

tion. Villain discusses at length the pathologic physiology of these cases with special reference to muscular action.

This action may be summed up as follows: The small fragment is drawn by the external pterygoid muscle forward, inward and downward, while the injured end of the large fragment is drawn backward, outward and upward. The treatment of the postlevator fractures is distinguished from that of other mandibular fractures by the fact that the posterior fragment cannot be held by fixation apparatus. The usual methods of leaving the work of repair entirely to nature or fixing the lower to the upper jaw are condemned. Villain's methods have for their object not only the maintenance of the large fragment in normal occlusion but also the preservation of its fractured surface in contact or in correct relation to that of the small fragment. He uses a splint attached to the upper and lower posterior teeth having a crank-like action and having a point of support which replaces the non-functioning joint. This apparatus varies somewhat with the direction of the fracture and the loss of substance.

Kazanjian (52) reports special methods of fixation to which he resorts in certain severe cases with marked comminution and displacement of small fragments. His observations are as follows. In certain cases, where the destruction covers an extensive area, difficulties of reduction and fixation present themselves, as in the following:

1. Extensive crushing of the jaw with laceration of the soft tissues and distant displacement of splinters, the teeth being lost either from the injury or previously.
2. The same condition with preservation of a few teeth markedly displaced.
3. Horizontal fractures associated with vertical fractures.
4. Extensive crushing of the anterior portion of the jaw, with such displacement of the fragments that consolidation is problematical although the quantity of bony tissue saved may be theoretically sufficient to permit it.

The displacement of the fragments is proportionate to the destruction of the equilibrium of the muscles which move the jaw. The greater the injury, the more pronounced the displacement upward of the posterior parts and downward of the anterior fragments. For consolidation to occur, it is indispensable that all of the fragments be replaced in good position and fixed there. The loss or absence of teeth is a serious obstacle, for it is clear that the small bone fragments themselves cannot be of great help in this fixation.

From the standpoint of treatment, the cases may be considered as follows:

1. Cases in which the crushed portion corresponds to the incisors, canines and premolars; displacement downward; the molars can be used for fixation of the splinters. A German silver arch, in the form of a bow, is fitted and cemented to the teeth in such a way that the two posterior segments are solidly maintained in perfect occlusion. This arch follows the curve of the bone at the height of the middle of the teeth. In its center is placed a T-shaped support, for the purpose of fixing a vulcanite piece which serves as a filling for the soft parts. Suture wires hold up against this arch the bony fragments at their normal height, reestablishing their normal points of contact. In the same way, in the case of a horizontal fracture, the inferior segment is made to approach the preserved segment.

2. Similar cases, with absence of teeth on one side. Bands of metal are fitted to the existing teeth, prolonged as far as the premolar region of the opposite side. They are cemented to the teeth and the suture wires placed as in the first case. If the lack of teeth has done away with the normal occlusion, a vulcanite piece is made for the upper jaw which keeps the fragment down in correct position. An extrabuccal piece may act as an adjuvant to immobilization, consisting of a plate of vulcanite fitted on the forehead and temporal regions, bound to the maxillary arch with a rigid wire.

3. Cases in which the fracture reaches from one angle to the other, with extensive crushing, displacement and absence of teeth. These cases require the same immobilization as in the first two types, but with slight modifications. Larger silver wires are fixed to the ends of the rami. An arch is fixed to them, upon which the bony fragments are suspended as heretofore. The upper teeth, when present, may serve for sustaining the apparatus; if not, recourse is had to an external appliance.

#### TECHNIQUE OF SUTURING THE FRAGMENTS

This is done as soon as possible after receipt of the wound, preferably within the first few days. All the sutures are placed from within the mouth, and not through the cutaneous tissues. At the first stage of the operation, the fragments are denuded to allow the passage of the wires. Local anæsthesia is preferred if possible, as it is less dangerous than general anæsthesia, which exposes the patient to the complications of bronchopneumonia and renders the work of the operator more difficult.

Absolute alignment is not always possible; the essential is to obtain contact with reduction of the displacement. The suture wire should not be removed for three or four weeks, a delay necessary for beginning consolidation. At this time, a chin cup may be employed as adjuvant, which would not have been possible at the first. The apparatus employed should give upward and forward pressure to counterbalance the action of the depressors. When cicatricial adhesion of the tissues tends to occur, a prosthetic piece is indicated.

This method is only applicable in cases where there are extensive fractures of the jaw, lesions of the soft tissues, and total or partial absence of the teeth. There is no need to have recourse to it in cases less grave. Even when complete consolidation is not obtained, the improvements which result justify the measure, for:

1. The power of regeneration of the bone is very great and experience has shown that the probabilities of union are good when the fragments are replaced in good position and in contact.

2. Even if union does not follow, future grafting operations are facilitated.

3. By the rapid fixation of the fragments, the facial contour is notably preserved.

4. Future autoplasmic operations are likewise facilitated.

#### COMPLICATIONS OF GUNSHOT WOUNDS OF THE FACE AND JAWS

*Hæmorrhage.* Valadier and Whale (90) state that a slight secondary oozing following these injuries is fairly common. Out of 1,010 cases, it was necessary to tie an artery in its continuity through a fresh incision in only eleven. In severe bleeding their routine practice is to tie at once the external carotid artery just above the origin of the superior thyroid. Kazanjian and Burrows (53) give the following figures based upon 400 cases of gunshot wounds of the face with fracture of the jaws; 34 mild and serious hæmorrhages occurred, or 8.5 per cent. Sixteen of these required operative measures for controlling the bleeding under a general anæsthetic, while the remaining seventeen were controlled by packing, clamping, or by the use of a local anæsthetic for ligation of the bleeding point. One case died suddenly from very profuse hæmorrhage. The majority of secondary hæmorrhages took place between the fourth and the twelfth days after injury; one occurred on the forty-fourth day.

It is not always possible to determine the artery which is responsible. Injuries to the inferior



maxilla are often accompanied by nasal bleeding from the deeper structures, which arises probably from the branches of the internal maxillary artery. Among ninety-one cases of fracture of the upper jaw, there were four hæmorrhages; in three of these hæmorrhage was easily controlled by packing, while in the remaining one it was persistent and recurrent. Hæmorrhage from the main trunk of the internal maxillary artery is rarely or never met with. In those cases where the wounds are below or behind the angle of the lower jaw and involve the pharyngeal cavity and the neck, it is difficult to decide by internal examination which side is responsible for the bleeding. Bleeding which occurs as the result of an extensive wound of the molar and bicuspid region of the lower jaw and accompanying injury of the floor of the mouth usually arises from the lingual artery or its branches. Such cases have been most common, seventeen out of thirty-four.

Certain cases which presage hæmorrhage from the lingual artery have recognizable characteristics. The wounds of entrance and exit are usually small, and situated in the vicinity of the posterior half of the lower jaw. The tongue is perforated, often dark purple in color, and swollen to twice or three times its normal size, so that the mouth is held open and the tongue protrudes beyond the lips. The jaw is fractured bilaterally and the anterior segment shows a pronounced downward displacement. On the other hand, large wounds anterior to the bicuspid region are unlikely to presage serious hæmorrhage, since the area affected is supplied only by smaller vessels. Extensive injuries, with destruction of the hard or soft tissues, but which are open, are less prone to bleed, because the free drainage forestalls the spread of sepsis. In the majority of cases of profuse intrabuccal hæmorrhage from the floor of the mouth, ligation of the bleeding point is impracticable, and the injured artery must be secured at some point proximal to the seat of trauma. The chief difficulty here is to recognize which artery is responsible. It is often impossible to determine from which side the hæmorrhage comes.

Broadly speaking, (a) bleeding from the floor of the mouth comes from one or both lingual arteries or their branches; (b) bleeding from between the fragments of a broken lower jaw arises from the inferior dental; (c) bleeding from the cheek or lip has its origin in a branch of the facial; (d) bleeding from the pharyngeal and tonsillar regions will call for ligation of the external carotid artery.

The fracture and comminution of the jaw-bone

and swelling of the tongue and soft tissues increase the difficulty of approximate localization of the bleeding point. To avoid these difficulties, the authors adopted the course of ligating the external carotid in all doubtful cases, but before long they reverted to the former practice of ligating, if possible, the individual artery involved. Ligation of the external carotid in these cases of extensive injury to the jaw, face and neck is attended by considerable difficulty and danger. Moreover, profuse recurrent hæmorrhage from the floor of the mouth nearly always arises from one or both lingual arteries or their branches. The procedure therefore in all copious hæmorrhages from this latter area, occurring in connection with gunshot wounds, is to ligate one or both lingual arteries, provided the anatomical conditions are compatible with a wound of these vessels.

To assume that the lingual is the source and to act on this assumption may seem on first thought to be unsound. However, improved results and lowered mortality more than justify the practice.

TABLE OF COMPARATIVE RESULTS

Artery Ligated	No. of Cases	Deaths	Mortality per cent
External carotid	10	5	50
Lingual	6	1	16.6

Ligation of the lingual artery should be done in its first or second portions, through a neck incision. If ligation of the external carotid becomes necessary, this should be tied high, so as to avoid thrombosis and embolism in the common carotid. Of the thirty-four cases of secondary hæmorrhage, seven died.

*Pneumonia.* Kazanjian (51) states that one-fifth of the patients with fractured jaws develop bronchitis or bronchopneumonia, due to the septic condition of the mouth. Infections of the respiratory tract are often induced in these septic mouth cases by the use of general anaesthesia in operations for concomitant wounds of other parts of the body. The mouth should always be cleaned and irrigated before giving a general anaesthetic. The use of morphine should be avoided when possible, as it may paralyze the laryngeal reflex and facilitate aspiration of septic matter from the mouth. Pre-anaesthetic medication should be limited to atropine. These patients should be kept in a sitting position as much as possible. Valadier (90) comments on the comparative rarity of lung complications in face and jaw injuries, in view of the septic condition of the mouth. Only one rib resection for empyema has had to be made in his service. For two years he

cleaned all jaw injuries with simple boiled water, avoiding antiseptics as much as possible.

*Grave local and general sepsis.* In 1,010 cases of jaw and facial injuries observed by Valadier (90) there were 27 deaths; of these 7 were beyond saving on their arrival. One case died of streptococcal septicæmia, one of septic meningitis, and one of general pyæmia. Two patients died of mediastinitis which spread from a retropharyngeal abscess in the track of the missile.

*Trismus or constriction.* According to Imbert and Réal (47) trismus seldom or never follows gross traumatism. It only succeeds small wounds whose healing has been rapid and which have not seriously altered the skeleton of the face. These authors have never seen true ankylosis of the mandibular joint after a wound. Only 10 to 20 per cent of cases of constriction of the jaws are due to cicatrices. Four-fifths belong to a form quite different and generally easily curable. This is characterized by the fact that it appears immediately after receipt of the wound, that it follows an insignificant lesion, and that opening of the mouth is easily brought about. The lesion is probably a simple contracture of the muscles of mastication (myotonia).

Treatment consists in spreading the jaws apart by a mouth opener with two divergent branches. This is introduced closed between the teeth and opened with a moderate but sustained pressure. During the opening the patient is made to talk, if possible, by asking him questions. Ordinarily, the operation is not painful. After the first treatment, there are two daily seances of half an hour each with the automatic mouth opener. Between treatments the mouth is kept open with wood blocks between the teeth, and cure should be obtained in two or three weeks. Herpin (40) has devised a simple wooden appliance, somewhat resembling a glove-stretcher, for the treatment of these cases. Colyer (12) and Huguet (44) describe more elaborate apparatus to ensure equal distribution of force. Valadier (90) employs plain wooden wedges.

Matti (57) groups cases of jaw closure following war injury into four categories as follows:

1. Injuries of the mandibular joint with bony ankylosis. These cases are to be treated by resection of the joint.

2. Wounds of the region of the coronoid process and temporal muscle. Bony union between the coronoid process and the zygoma or base of the skull. Operative treatment.

3. Chronic inflammatory alterations with considerable shrinkage in the region of the masseter or of the pterygoid muscles as a result of long-

standing suppuration. Slight cases are treated by stretching under anæsthetic and long-continued after-treatment with screw gags. Operative treatment for severe cases.

4. Pertinacious and high grade contraction of the muscles of mastication caused by chronic irritation arising from a punctured wound of the region (probably the same type of cases referred to by Imbert and Réal as myotonia). Treatment by forcible stretching under anæsthetic, and after-treatment with screw gags.

#### DIET

Pont (81) in patients wearing splints which lock the jaws together recommends the following daily diet: 3 liters of milk; 4 eggs; 1 liter of bouillon; 100 grams of meat juice; 1 liter of wine.

The patients are weighed every four days and in nearly all cases the weight is maintained and even augmented sometimes.

Colyer (12) gives the following graduated diet in face and jaw injuries: (a) fluids: milk, beef tea, chicken broth, supplemented by extras; (b) minced: minced chicken, minced ordinary diet, supplemented by minced fish, eggs, and semifluid pudding; (c) boiled ordinary diet, supplemented by fish, eggs, suet puddings, and toast; (d) ordinary regulation diet.

Kazanjian (51) gives liquid food either through a porcelain feeder or through a funnel and rubber tube which can be carried far back in the mouth. His summary of dietary is as follows: (a) For acute injury of the jaw, liquid, every two hours during the day, and every four hours during the night. Milk, one pint, one egg, or strong soup or Benger's food with an egg, or Bovril made with milk, or thin arrowroot with Valentine's meat juice, or boiled custard with the addition of stimulants, brandy or port wine as ordered. In twenty-four hours there would be required four pints of milk; four eggs; two pints of soup. (b) Semi-liquid dietary for convalescent patients, same as above in four-hourly feeds. In addition, baked custard, strained fruit juice or stewed fruit, jelly, Benger's food, bread and milk, porridge. (c) Semi-solid dietary for convalescent patients, for breakfast (7:45 a.m.) porridge, one pint, milk, one pint, sugar, tea, thin bread and butter. Alternative, bread and milk or gruel. For lunch (11:00 a.m.) bread and milk or beef tea with bread. For dinner (1:00 p.m.) minced meat, mashed potatoes, greens, milk pudding. For tea (4:00 p.m.) tea or bread and milk; two eggs lightly boiled, poached, fried, or scrambled; bread and butter. For supper (7:00 p.m.) cocoa, one pint, or bread and milk.



## PSEUDARTHROSIS

According to Imbert and Réal (48), surgical treatment of pseudarthrosis comprises two principal methods. The first is applicable to fractures with loss of substance equal to the width of two molars (3 cm.) at most, simple osteosynthesis. The other can be employed where the loss is greater, namely, bone grafting. In performing osteosynthesis, the authors, under chloroform anæsthesia, expose the involved area through a curved incision, dissect out the fractured ends of the bone, excising fibrous tissue, and squaring and freshening the ends by means of a burr in the electric engine. The fragments are brought into close contact and held in place by a metallic plate fixed by screws. The screws should avoid the sockets of the teeth and the plate be placed as near as possible to the lower border of the jaw. The upper and lower teeth are fixed in occlusion with brass ligatures and maintained thus for two months at least.

The indications, technique, and results of bone or cartilage transplantation in pseudarthrosis after gunshot fractures of the lower jaw have been given the close attention of many workers. Free tibial grafts receive consideration by McWilliams (59), Du Bouchet (19), Pont (81), and others. Direct free rib grafts are favored by Gallie and Robertson (32), and indirect rib transplantation is described by Imbert and Réal (46). Cavalié (8) prefers a pedicled graft taken from the jaw itself. The chief exponent of cartilaginous transplants is Morestin, whose principal articles are referred to (64, 65, 66). The more important points in these articles will now be discussed.

Bone grafts are indicated according to practically all authors, only in old cases of pseudarthrosis. Aside from cases with great loss of substance, the bone-grafting operation should always have been preceded by a prolonged treatment by prosthetic fixation whose inefficacy should have been well demonstrated. The essential requirements emphasized by practically everyone for successful grafting are as follows: (a) Operation should be performed only in the absence of any inflammatory or pathological condition in the region. (b) Communication of the mouth cavity with the wound must be avoided. (c) It is indispensable that as perfect immobilization as possible be assured by apparatus fixing the lower teeth to the upper.

Gallie and Robertson (32) draw attention to the principles that should govern bone grafting. The so-called living autogenous bone graft is alive only by virtue of the osteoblasts that are free on its surfaces and in the mouths of the

haversian canals. All the rest of the graft dies and is absorbed. It owes its value in bridging gaps and in encouraging union of ununited fragments to the fact that during the process of its absorption, the osteoblasts which invaded it from its own surface and from the neighboring bones build up new bone to take the place of that which is absorbed, so that ultimately the break in the continuity of the injured bone is bridged by new and healthy bone. This fact indicates the necessity for perfect contact of the graft to fresh and healthy bone in the fragments; it also shows the importance of using as a graft bone from which the periosteal and endosteal surfaces have not been removed, as it is on these surfaces that the greatest number of osteoblasts are to be found. For the same reason the graft should be made from bone which is as porous as the requirements of the case in relation to strength will allow; hence the value of the rib as a graft, particularly if it has been opened up so that the osteoblasts of the interior can obtain the necessary lymph.

In bridging gaps for fracture of the mandible, the following technique is used: The fragments are exposed by a long incision along the lower border of the jaw. The motor saw is then applied to the fragments, and a saw cut made along the inferior border extending an inch to an inch and a half back from the end of the fragment and about half an inch deep. Great care must be taken to avoid opening into the cavity of the mouth or into the sockets of the teeth. An osteotome is then driven into the saw cut, and a greenstick fracture produced, widening the wedge-shaped gap for the reception of the graft. An interdental splint which has previously been cemented to the teeth of both jaws is now locked, with the teeth of the two jaws in exactly the correct relation to one another.

The graft is made by resecting three inches of the rib. This piece of rib is then split on the flat, in order that the endosteal surface may be bathed in lymph. Half of the graft is then driven into the slots in the fragments, the smooth side of the rib facing toward the mouth cavity. This leaves the rough, cancellous surface of the graft facing outward and sunk somewhat below the outer surface of the jaw. This depressed area is then filled out by laying a piece of the other half of the rib in the gap, with the smooth side out. The fragments and grafts are now fastened solidly in place with kangaroo tendon passed through drill-holes. This adds additional security although it is really unnecessary, as the principal graft is self-retaining, being wedged solidly into the saw cuts in the fragments.



The operations on the jaws have been most satisfactory. Several soldiers have been operated upon by this technique who have been able to eat ordinary food five months after the implantation of a graft which has bridged gaps of from one to two inches.

Du Bouchet (19) finds that most of the methods of bone grafting in respect to the lower jaw are complicated and uncertain in their results. He describes a technique for which he claims ease and rapidity, necessity for no special instruments, assurance of broad surfaces of bony contact, simple and efficient fixation of the graft, and utilization of the osteogenetic power of the neighboring periosteum. The site of pseudarthrosis is exposed by an appropriate incision, utilizing if possible the line of an old scar. Without touching the pseudarthrosis, the periosteum of the two fragments is incised and then with the elevator a pocket is very easily formed between the bone and the periosteum. The dimensions to be given to the graft are then measured so that the latter will bridge the pseudarthrosis and exceed it by two centimeters at each end. Nothing is more convenient for this purpose than the common carpenter's compass, with set screw. After very careful hæmostasis, the osteoperiosteal pockets are packed, and attention is turned to making the graft. This is removed from the inner surface of the tibia with a thin Macewen osteotome and mallet, and comprises the periosteum and the compact bony tissue. Its dimensions are arrived at by measurement with the compass, and are usually about 6 to 8 cm. long and  $1\frac{1}{2}$  cm. wide. The graft is seized directly in a small forceps and carried to its osteoperiosteal bed, sliding readily into the two pockets. Nothing remains but to suture the two wounds.

A very conservative estimate of the value of bone grafting is given by Imbert and Réal (46). These authors consider that altogether too much has been claimed for the procedure. When the lost bone amounts to less than 3 cm., the graft should be successful in exciting osteogenesis in the fractured ends, taking no part however in callus formation. When the breach amounts to over 3 cm., the results are uncertain, and it is not thought that the graft of itself can reconstitute the continuity and, above all, the solidity of the bone. Nevertheless, the results obtained are not negligible, since for an absolutely floating pseudarthrosis is substituted a double but close false union.

In order to reduce the danger of infection to a minimum the operation should be performed in two stages. The first operation consists in the

removal of the piece of bone to be transplanted, the rib being used exclusively, and its burial under the skin of the region where it is to be later fixed. The rib segment is placed in the soft tissues with its concave surface forward. At the end of a month, the graft is loosened in its bed, without disturbing the new vascular attachments, turned so that the convex surface faces outward, and fixed to the ends of the fractured bone by the usual methods of screws or ligatures.

Cavalié's method (8) consists of an autograft taken from the jaw itself where the graft presents the same biologic qualities as the fractured fragments. If the bony breach is less than 2 or 3 cm., it suffices generally to have only one graft which can be cut long enough from one fragment. If the bony gap is over 2 or 3 cm. wide, it may be necessary to cut the graft from each fragment and to unite them in the middle of the breach.

The graft is detached by cutting with shears the lower bridge of union with the inner table. Then this is separated with a flat narrow chisel passed into the spongy tissue, and the end of the graft away from the fracture is detached with the chisel. The graft is then slid across the breach until the end enters between the two tables into the spongy tissue of the opposite fragment, while its other end rests in contact, by its deep spongy surface, with the substance of the fragment of origin. It is sometimes possible to leave the graft some periosteal adherence to the fragment of origin. In other cases, the graft is turned over toward the opposite fragment after the manner of a hinge. The graft is fixed with catgut sutures.

Morestin (64, 66) is the principal exponent of the use of cartilage transplants for the repair of defects in the jaws. He employs the cartilage of the sixth, seventh and eighth ribs. The advantages he claims for cartilage over bone as a transplant are many. Resection of costal cartilage, if performed properly, never gives rise to untoward consequences. The cartilage can be easily cut with a knife into the exact shape desired, and without the need for special instruments. The transplanted fragments readily adapt themselves to their new location, and are rarely thrown off or re-absorbed.

Absolute rigidity of the jaw does not result from cartilage grafting. There is never actual union between the cartilaginous and the bony tissue. All that can be hoped for is a filling in of the gap, the placing of an obstacle in the way of reproduction of vicious position, and very often there exists a very close pseudarthrosis between the extremities of the bone and the cartilaginous piece. In the latter case, the persistence of a



slight, obscure mobility does not cause noteworthy interference with the function of the jaw. Morestin performs the first part of the operation, i.e., removal of the cartilaginous piece, under chloroform anaesthesia. The facial stage is accomplished entirely under local anaesthesia. Thus most of the dangers of infection by saliva are done away with, one is not hampered by the anaesthetist, and the maneuvers are more conveniently carried out with the patient conscious.

Morestin employs costal cartilage for reconstruction of other bones than the lower jaw, viz., the malar bone (62), the upper jaw (63), etc. Sebileau (85), in discussing Morestin's methods, says that the objects of treatment in gunshot fractures of the lower jaw are (a) cosmetic, (b) functional, as exemplified in restoration of the correct occlusion of the teeth, and (c) restoration of the continuity of the bone. The cosmetic results of cartilage transplantation cannot be denied. As to the restoration of dental occlusion, he does not consider that this has been achieved in any of Morestin's cases; nor is the continuity of the jaw-bone re-established sufficiently to permit the mastication of solid food. From the functional standpoint, therefore, he does not regard cartilage transplantation in these cases as a successful procedure.

#### PLASTIC SURGERY OF THE SOFT TISSUES

The secondary repair of war injuries of the soft tissues of the face is brought about by employment of various well-known methods used in civil practice, viz., by free Wolff and Thiersch grafts, by sliding flaps from neighboring parts, by pedicled flaps from nearby or from distant parts such as the neck, chest, and arm. The best notion of the application of these methods to war injuries is gained by a study of the illustrated reports of individual cases, as each case is different in some respects from every other case. The articles of Cole (10), Esser (24, 25), Gilles (33), von Hacker (35), Horsley (43), Moure (70), Morestin (60, 61), Piétri (77), Pont (78, 79), Valadier and Whale (90) are replete with interesting cases. Most of the authors point out the value of immediate replacement after the injury of the lacerated tissues into their approximately correct position, thus enormously facilitating later corrective measures.

Secondary plastic operations should not be performed too early when infection is still present in the scar tissue. According to Whale (90), pedicles of transplanted flaps can rarely be divided safely after ten or fourteen days, as often stated; three weeks is as a rule a minimum. The

margin allowed for shrinkage of flaps is commonly given as one-sixth of the area, but in Whale's experience one-third is more accurate, i.e., a piece of soft tissue should be cut one-third larger than it is ultimately intended to be.

Esser (24) prefers to cover defects of the face with tissue from the immediate neighborhood, avoiding, if possible, the use of pedicle flaps from a distance. In this way the skin of the area covered closely resembles that of the rest of the face. In almost every instance, even with very large defects, this principle can be carried out. The one point necessary is that the parts be made sufficiently movable, either by cutting on one side, half pedicled, or when necessary with entire pedicles. A new technique for Thiersch grafts is described by Esser (25), viz., the epidermic inlay in combination with dental modeling composition. The bad results of Thiersch skin grafting are largely due to irregular healing of the skin and the grafts, with the formation of scars. Esser, in seeking a means for applying the Thiersch evenly and maintaining it immovable under equal pressure on the wound for several days, conceived the idea of stretching the skin graft on an impression of the wound made in dental modeling composition, inserting this in the hollow of the wound, and suturing the edges of the wound over it.

The types of cases in which this method is serviceable are: (a) enlargement of the conjunctival sac; (b) construction of a part or of the entire ear; (c) enlargement of mucous membrane of the mouth; (d) enlargement of the mouth cavity; (e) defect of the hard and soft palate; (f) covering of various forms of skin flaps.

Cole (10) emphasizes that the principles and plan of treatment of face and jaw injuries should from the very first be evolved by the combined efforts and pooled knowledge of the surgeon and the dental surgeon concerned. In the majority of cases a wound of the cheek involving the mucous membrane is complicated by fracture more or less extensive of the lower or upper jaw. From the viewpoint of function the bony lesion is of more importance than the injury to the soft tissues, and its efficient treatment should consequently hold first place. If this be neglected and the soft tissues closed early, the functional outlook may be hopeless, owing to the patient's mouth being fixed in a closed position by the contracting scar, demanding a secondary operation which leaves the patient in the same condition as when wounded. Cole is convinced that primary suture of such wounds should never be undertaken when complicated by an associated

fracture unless the fracture can be dealt with at the same time.

In the majority of cases, therefore, it becomes necessary before operating on the soft tissues to wait until all sepsis has disappeared and the wound has soundly healed. The waiting time can be utilized for controlling and limiting contraction of the scar tissue as far as possible. In the case of a cicatrizing wound threatening the movements of any particular joint, it is the surgeon's endeavor to maintain the joint in that position which will most effectually conserve the movement whose limitation is threatened. The movement limited or rendered impossible here will be that of opening the mouth. It is necessary therefore to apply a splint to hold the jaws in the position of open bite. In association with the open bite splint the author is accustomed to using a smooth adjustable shield in the mouth which prevents prolapse of the lips of the wound, maintains contour, and preserves the buccal sulcus. For repairing these defects involving the mucous membrane of the cheek it is advisable to employ doubly epithelialized pedicled flaps from the neck or scalp, direct borrowing usually being unsatisfactory. In using scalp flaps for non-hairy parts, depilation may be carried out with the X-ray.

#### FACIAL PARALYSIS

Morestin (67) describes a case of facial paralysis due to gunshot injury, which he treated by muscle anastomosis. Two operations were performed under local anesthesia. At the first operation, a slightly curved incision was made following the anterior boundary of the temporal fossa, descending to the malar bone, about 7 cm. in length. A bundle of fibers was detached from the anterior part of the temporal muscle, left continuous below with the main portion. The fibers of the orbicularis palpebrarum were then sought beneath the skin of the lower eyelid and the bundle of muscle fibers from the temporal was inserted beneath them, being fixed with a few buried sutures of fine catgut. Before placing and tying the threads, the most favorable points for correcting the vicious attitude of the eyelid were selected by making traction with forceps and the result noted. The cutaneous wound was closed without drainage.

At the second operation, an incision 5 cm. long was made under the angle of the jaw, the anterior border and part of the external surface of the masseter being exposed. The buccinator was then sought and drawn back and fixed by a series of buried sutures to the anterior border, to the aponeurosis, and to the superficial fibers of the

masseter, the points of suture being guided by the effects of traction at certain points.

These operations, while far from bringing about restoration of function, at the same time cause to a large extent the disappearance of the asymmetry of the face when the muscles are at rest; when the muscles are in action, the asymmetry increases, but is not nearly so marked as previously. The patient cannot completely close the right eye, but by comparison with the previous condition, a great improvement is seen, the eyeball being better protected, the lacrymation having ceased, and the conjunctival irritation having disappeared. This method, particularly in cases of gunshot wound where the search for ends of the nerve would be fruitless, can therefore render valuable service as a palliative measure.

#### SALIVARY FISTULÆ

Salivary fistulæ resulting from war wounds practically always are connected with the parotid gland and its duct, injuries in the submaxillary region rarely being followed by salivary fistulæ.

All the authors divide these fistulæ into two forms: (a) glandular fistulæ; (b) fistulæ of Steno's duct. An idea of the relative frequency of these two forms may be gained by noting Morestin's figures (68). Since the beginning of 1915, this surgeon has treated 62 salivary fistulæ, 30 being glandular and 32 involving Steno's duct.

*Parotid glandular fistulæ.* According to Dieulaufé (15), clean incised wounds involving the parotid gland usually heal spontaneously. The destructive wounds caused by modern war projectiles, always complicated by infection which involves the individual lobules and acini of the gland, frequently lead to fistulæ.

*Symptoms.* The fact that a fistula exists may be hidden for some time, being masked by the inflammatory phenomena which give rise to suppuration. In these cases the fistulæ are preceded by a slowly progressive salivary tumor, varying in volume from day to day. After recession of the inflammatory phenomena, there is observed at a place on the surface of the masseter or in the sternomaxillary space a small reddish point, flattened or acuminate, at the site of which is established a flow of thin, clear liquid, limited to a few drops when the jaws are at rest, becoming abundant and at times excessive during the movements of mastication. The diagnosis can only be in doubt in cases where a very small fistula exists or where suppuration of the parotid wound is still very marked; in these cases, if observation of the production of secretion is not sufficient to establish the diagnosis, the function-



ing of the gland is provoked by touching the lingual mucosa with a drop of vinegar or by making the patient masticate a small piece of hard bread; there will then be seen streaming abundantly from the fistulous point in veritable jets a clear, thin fluid. The patient himself may make the diagnosis by noticing a marked increase in the flow of liquid at meal times, and may be literally inundated by the saliva which runs down his cheek to his clothing.

The fistulous openings may be multiple, but those generally observed are single. The site of the lesion varies, all of the region occupied by the parotid being subject to traumatism or suppurative complications by extension from the original wound. Spontaneous closure of glandular fistulæ sometimes occurs, but not so frequently after war injuries as after those seen in civil practice.

According to Piétri (76), the location and direction of the wound in relation to the intraglandular ducts have an important bearing on the gravity of the case. The principal intraparotid collecting duct emerges from the anterior border of the gland at the junction of its upper and middle thirds. Anatomical considerations show that a wound situated farther from the median collecting duct will involve a rather large number of collateral branches, while a wound of the upper or lower portion of the gland will involve, especially if superficial, only small unimportant branches. Spontaneous healing often occurs in these latter cases.

If the wound is parallel to the principal parotid duct and situated very close to it, the lesion will involve, near to their point of junction with the main collecting channel, all the collateral branches coming from the portion of gland above or below the lesion, resulting in an obstinate salivary fistula. In a vertical wound of the parotid, the median duct may or may not be involved. If the median duct is spared, the collateral branches involved will often be unimportant, and in any case will be few in number so that the external flow of saliva will be relatively slight, and healing of the wound easily accomplished. If, on the contrary, the vertical lesion involves the central duct of the gland, the flow of saliva from the wound may be very abundant. All of the saliva carried by the collateral branches mesial to the section will flow out by the wound. Furthermore, since the presence of valves regulating the flow of saliva in the excretory canal has not been demonstrated, a portion of the saliva emptying by collateral branches distal to the section may be discharged through the wound instead of into the mouth.

Surgical intervention in a case of this kind, in order to have some chance of success, must aim not only to direct into the mouth the flow of saliva discharged into the duct behind the solution of continuity, but also to prevent at the same time the discharge through the wound of saliva entering the anterior portion of the canal. The second part of this problem seems easily achieved, but the first, on the other hand, may appear impossible, owing to continuous secretion from the posterior part of the gland interfering with cicatrization of the wound.

*Treatment.* The multiplicity of procedures proposed proves that no one of them can be used exclusively for all cases. Dieulafé discusses most of the methods of treatment that have been employed, such as compression, excision of the fistulous region followed by suture, oily injections, etc. He briefly dismisses immobilization of the jaws as a method of treatment *per se* with the remark that many cases will heal spontaneously when the jaw is free and mobile, and that persistence of the fistula is found just as often among patients who have had the mouth closed during a long period as among those who have all the time preserved their masticatory movements.

Piétri, on the other hand, believes that the simple procedure of immobilization of the jaws should be tried first in all cases before resorting to operation, claiming that it is logical to favor healing by diminishing the production of saliva through the suppression of the function of mastication and reducing gustatory sensation. He uses a skull cap of woven material which prevents the mouth from being opened. In certain cases it is advisable to combine this with intermaxillary ligation or splinting of the teeth. The patient is given liquid diet for several weeks, and abstinence from speech as far as possible is enjoined. As the fistula is seen to close, in the return to normal, the diet is increased by gradual stages. It is not known what becomes of the parotid gland in the course of this treatment, but it probably enters simply into a state of rest, and then, with mastication, if the excretory duct is permeable, it takes up again its normal function. It cannot be claimed that this method of immobilization of the jaws is infallible; however, it is so simple, and the results obtained are so encouraging, that it is always worthy of trial. Piétri's observations are based on 38 cured cases.

*Cauterization.* Dieulafé recommends cauterization with silver nitrate for small fistulæ draining slightly and limited to small groups of acini. Cauterization with a fine thermocautery point has also given him good results. The accessible

portions of the parenchyma are reached directly through the fistulous tract by application of the cautery two or three times at three or four days' interval. This may be insufficient and at the same time the lesions may be too insignificant to justify an operation. In these cases Dieulaufé makes an incision above and below the fistula (always in the direction of the fibers of the facial nerve) and through this little opening he touches with the cautery all of the exposed surface; he then cures or excises the cutaneous tract and reunites the skin with horsehair or silk threads. One of the foregoing methods is indicated particularly for small fistulæ following intraglandular suppuration.

*Creation of an artificial opening into the mouth.* In cases of fistula involving portions of the parotid parenchyma which is spread over the surface of the masseter and near the anterior border of this muscle, Dieulaufé imitates the procedure which he applies to fistulæ of Steno's duct when this duct is injured at its posterior extremity or when it is grasped very tightly in scar tissue. A tunneled sound with a blunt end is introduced into the cutaneous orifice and thrust gently through the tract. The skin is sectioned in a linear direction anteriorly and posteriorly to the sound, and the end of the sound must not be displaced and must always remain in contact with the bottom of the fistula, this being the point where the junction of the abnormally open acini or canalaculi occurs and serving as the landmark for transfixion. Without losing contact, the sound is directed obliquely forward toward the mucous membrane of the cheek and perforates through the injured parenchyma; with a narrow bistoury and guided by the sound, all the tissues are opened which separate the gland from the buccal cavity, the incision passing over the anterior border of the masseter, for if this muscle were transfixed, the new tract would be quickly closed by muscular contractions. A very oblique tract is thus made through the gland, the aponeurosis of the cheek, the fatty pad of Bichat, and the mucous membrane. The tissues in front of the masseter are drawn forward in order to avoid cutting the facial vessels. A rubber drain is introduced into the tract, 6 or 8 mm. long, by means of a forceps passed from the mouth through the orifice made in the mucous membrane; the forceps is pushed as far as the cutaneous opening, the drain grasped and drawn toward the mouth, and secured by a thread attached to the neck of a tooth. On the skin side the drain is cut even with the parenchyma of the gland, and the cutaneous incision sutured over it after excision of the

fistulous tract. The drain is left in place as long as possible, ten, twelve or fifteen days, in order to ensure the production of a well-formed false duct.

*Resection of the auriculotemporal nerve.* Deupès (14) and Dieulaufé each call attention to the rationality of diminishing the secretory function in fistula of the parotid gland by resection of the auriculotemporal nerve. Claude Bernard first demonstrated the secretory rôle of this nerve. Later experiments have shown that the secretory fibers carried by the auriculotemporal come neither from the inferior maxillary nor from the facial, but from the glossopharyngeal through the nerve of Jacobson which supplies the small deep petrosal nerve to the otic ganglion. Dieulaufé believes that the cervical sympathetic and facial nerves also play a secretory rôle.

Deupès thus describes the course of the auriculotemporal nerve. It arises from the posterior branch of the inferior maxillary by roots arranged in the form of a buttonhole through which passes the middle meningeal artery, progresses toward the neck of the condyle, passes around this, penetrates the parotid gland, and runs toward the zygomatic arch in a vertical direction as far as its final distribution in the temporal region. Maigrot likened the course of the nerve to the shape of a Deschamps pedicle needle, whose concavity corresponds to the posterior border of the condyle; he divides it into three segments, the first from its origin to its entrance into the parotid, the second within the parotid, and the third the temporal portion. It is the second segment of the nerve which gives off the parotid fibers, behind the condyle; and this is the portion which must be attacked in order to suppress the secretion of the parotid gland.

Deupès thus summarizes the technique of resection of the auriculotemporal nerve in fistulæ of the parotid gland:

1. Local anæsthesia with novocaine adrenalin.
2. Vertical incision about 3 cm. in length half above and half below the zygomatic arch.
3. Search for the nerve. The pulsation of the temporal artery may be suppressed by the vasoconstrictor action of the local anæsthetic solution, and therefore this landmark may not be available. The nerve-trunk is behind the vessels, and it may be necessary to seek under the upper part of the incision a peripheral filament, and follow it down to the trunk.
4. Dissection of the nerve in the parotid sheath down to the lower part of the incision, i.e., to the glandular tissue.
5. Gentle traction on the nerve, according to the Thiersch method, with a hæmostatic forceps



in such a way as to obtain the greatest length possible before rupture. This stage is always rather painful.

6. Reunion of the skin edges with Michel clamps.

Deupès has performed this operation on two patients wounded by grenade splinters, in whom the injuries were almost identical. The projectiles had been exfoliated with some tooth fragments, and there was no other damage than that to the tissues of the cheek and to the parotid gland; a rather severe trismus and the fistulous tract were the only functional disturbances. The fistulous orifice was situated about 10 or 12 mm. in front of and a little below the lobe of the right ear. During feeding saliva appeared and flowed abundantly. In both cases, the salivary secretion ceased immediately after the operation.

Dieulafé also recommends the performance of a very extensive resection of the nerve. He reserves local anæsthesia for cases with no inflammation of the scar tissue of the region, while he prefers general anæsthesia in cases with inflammation. In front of the tragus an incision 4 cm. in length is made, ascending a little in front of the ear and descending as far as the posterior border of the jaw-bone a little below the neck of the condyle; beneath the skin in front of the ear the temporal artery is carefully sought by its pulsation. Behind the vessels, the nerve is found, isolated, seized in a flat-beaked forceps, and its peripheral end sectioned; descending through the gland the nerve is isolated. In some cases the anastomosing branch from the facial may be seen and cut separately. When the nerve has been isolated from the depths of the gland, a twisting motion is given to the forceps, the nerve being wrapped about the beaks as it stretches, the deepest portions are detached and it breaks solely by the mechanism of avulsion.

In operating in a cicatricial field, the search for the nerve is difficult, and it may be necessary to ascend into healthy tissue, find a peripheral branch and trace this down to the main trunk. The operation is useless if all of the glandular portion of the nerve be not resected, taking in all of the secretory fibers and the anastomosing branch from the facial. Dieulafé finds that the secretion of saliva always persists for a few days after the operation, but gradually disappears. He has successfully performed the operation in five cases, in two of which it was necessary to complete the cure by cauterization which had previously failed alone.

*Fistulæ of Steno's duct.* Dieulafé finds that the war has greatly enriched surgical practice in

regard to fistulæ of Steno's duct. He has met with three forms: (a) very limited traumatism of the cheek by shell fragment, involving directly the duct of Steno and creating the fistula by a lateral section of the canal; (b) great destruction of the cheek by shell fragments followed by contractile scars occluding the duct, obliterating its normal orifice and leaving open the skin wound which involves it; (c) destructive traumatism by shell fragments, involving the bone and soft parts and giving rise to inflammatory phenomena which open an abscess and cause a fistula of the duct of Steno. The second form is by far the most common.

Taking into consideration the frequency of facial wounds in the present war and the extensive injuries which they produce, salivary fistula must be regarded as an uncommon complication. In the healing of wounds of this region the contraction of the scar tissue frequently acts as a spontaneous ligature of the canal followed by secondary arrest of the secretory function and glandular atrophy. In performing secondary cosmetic plastic operations in this region, it is frequently noted that no trace of the duct can be found in the mass of scar tissue. In view of this spontaneous tendency toward cure, fistulæ should only be regarded as permanent after persistence of salivary flow through an abnormal opening some time after the original wound has healed.

*Symptoms.* Generally there is a point of granulation situated in the region of the masseter or of the buccinator, through which clear fluid is seen emerging. This flow becomes very abundant during mastication, and is more marked in cases of parenchymatous fistulæ, because all of the parotid saliva is discharged through the opening. The quantity of saliva discharged is variable; a patient of Duphoenix lost 70 grammes in one-quarter of an hour; a patient of Jobert lost several cupfuls in twenty-four hours. Mischerlich has observed a fistula which only gave 60 to 95 gm. in twenty-four hours. Beaunis notes that the average amount of the secretion is between 80 and 100 gm. per day, while Hirschfeld has collected one-fourth of a liter at a single meal. The quantity of course varies according to whether the fistula is partial or complete.

At times the saliva accompanies purulent secretions arising from the inflammatory site with which the history of the fistula is bound up; at other times the salivary flow is the only symptom. The loss of a large quantity of a fluid which normally acts as a useful secretion and which contains mineral salts, especially chlorides and phosphates, leads at length to a weakening of the

organism; besides, the abundance of the flow itself constitutes a true infirmity. In these cases a more or less visible orifice leads down to Steno's duct. There exists at times a sort of cystic pouch at the site of the fistula, which empties itself easily by pressure. This pocket is caused by the accumulation of fluid between the wound in the canal and the cutaneous orifice. Its existence, when intervention is to be made, is a valuable landmark in the formation of a new duct.

*Treatment.* After reviewing all of the various procedures that have been suggested for the cure of fistulæ of Steno's duct, Dieulafoy considers that the creation of an artificial passageway by transfixion through the cheek is most applicable to the majority of cases occurring in the wounded in whom as a rule the situation of the fistula and the scar tissue present do not permit a dissection of the posterior end of the duct. The technique followed is the same as that previously described under fistulæ of the parenchyma overlying the masseter muscle. Dieulafoy has performed this operation four times, always successfully.

*Transplantation of Steno's duct* is advised by Dieulafoy when one can find an appreciable segment of the posterior end which can be fixed to healthy oral mucous membrane. He has performed this twice successfully. Dieulafoy hesitates to advise resection of the auriculotemporal nerve for fistula of Steno's duct, which should usually be susceptible of cure either by transplantation or transfixion.

*Ligation of Steno's duct.* Certain authors have obtained suppression of the parotid secretion by imitating a process that nature has put in practice in numerous face mutilations. In a large number of cases Steno's duct has been the seat of a destructive wound and later occluded by a cicatricial process causing all cessation of secretion and secondary atrophy of the corresponding parotid gland. Morestin is led to artificial obliteration of the duct by several considerations, as he has found in the patients treated that reimplantation of the duct after elimination of the fistulized portion was impossible, and internal drainage pure and simple rarely utilizable. His procedure, then, is to extirpate Steno's duct, ligate its stump at its origin, and obtain reunion without drainage. Obliteration of the duct brings about rapid physiological death of the parotid gland, but Morestin says that this has no perceptible effect on the organism. This complete radical operation has been done in thirteen cases with excellent results and Morestin now employs the method exclusively. In performing this operation it is important to remove all of the fibrous scar tissue

through which the fistulous tract passed, so that only supple and healthy tissues are left.

*Summary.* From the experience of the four authors quoted, the most suitable treatment for the various forms of parotid fistulæ may be summed up as follows:

1. Glandular fistulæ. (a) For slight or moderate discharges, immobilization of the jaws, with or without cauterization; (b) for moderate or more obstinate cases, cauterization, or creation of an artificial opening into the mouth by transfixion of the cheek; (c) for persistent cases that do not respond to other treatment, resection of the auriculotemporal nerve.

2. Fistulæ of Steno's duct. (a) For cases in which an appreciable segment of the posterior end of the duct can be freed, transplantation of the duct into the buccal mucous membrane; (b) for cases in which the situation of the fistula and the scar tissue do not permit freeing of a sufficient segment of the posterior end of the duct, creation of an artificial opening into the mouth by transfixion of the cheek; (c) where internal drainage of the parotid cannot be brought about, permanent occlusion of the duct by ligature.

#### ANÆSTHESIA

The general consensus of opinion favors local and regional anæsthesia for the performance of secondary plastic operations on the face and jaws. The anæsthetic of choice is novocaine-adrenalin. The technique of regional anæsthesia for these operations is described in the papers of Thoma (88), and Canuyt and Rozier (7).

#### PROSTHETIC FACIAL RECONSTRUCTION

This question goes more or less hand in hand with that of replacement of lost portions of jawbone by artificial substitutes. The artificial restoration of features requires on the one hand great artistic ability and on the other mechanical ingenuity. Derwent Wood, a well-known artist, has made a special study of this question, replacing the lost features by painted copper masks (93). Pont (78, 79, 80) has also devoted considerable attention to the subject and has adapted a plastic material for this purpose, which can be adjusted from time to time by the patient himself.

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# ABSTRACTS OF CURRENT LITERATURE

## GENERAL SURGERY—SURGICAL TECHNIQUE

### OPERATIVE SURGERY AND TECHNIQUE

**Walther, C.: Note on a New Method of Treating Elephantiasis of the Limbs** (Note sur une nouvelle méthode de traitement de l'éléphantiasis des membres). *Bull. Acad. de méd.*, Par., 1918, lxxix, 195.

In the treatment of recent cases of elephantiasis, Walther has discarded the recognized methods, as he believed he could obtain a better and more lasting result by employing buried rubber drainage tubes which are perfectly tolerated by the tissues as proved by numerous examples.

He makes a small incision in the middle part of the antero-internal face of the thigh, another on the abdominal wall; a small non-perforated rubber drain, No. 10 or 12, is passed by a Chaisaignac trocar, a relay incision being made in Scarpa's triangle. The drain travels in the deep layer of the fascia superficialis against the aponeurosis. A buttonhole is made in the aponeurotic extremity in which the corresponding end of the drain is inserted. An eyelet is cut in the tube in order to insure drainage of the superficial lymphatics.

Details of three cases in which excellent results were obtained are given.

W. A. BRENNAN.

### ASEPTIC AND ANTISEPTIC SURGERY

**Morrison, J. T., Hartley, J. N. J., and Bashford, E. F.: Delayed Primary Suture of Wounds.** *Lancet*, Lond., 1918, cxciv, 534.

Early and thorough resection of wounds is now universally recognized as the great prophylactic against sepsis. The term "delayed primary suture" has been applied to all cases of suture performed during the first five days after infliction of the wound, with the exception of those closed at the preliminary cleansing operation.

Seriously wounded patients arrive at this hospital in the middle of the night and from thirty-six hours to three days after having been hit. They are made comfortable, lightly fed, and encouraged to sleep. The next morning wounds are examined and are X-rayed if there is any suspicion that a foreign body is still present. If the temperature is not rising and the pulse-rate is satisfactory, a moderate degree of fever is no contra-indication to suture at this stage. The wound must be free from all suppuration and all clinical evidence of infection. Smears by platinum loops passed into every suspicious nook of the wound are made and examined in the way laid down by Carrel. If not

more than one bacillus or coccus is present in any one film of the microscope, or one diplococcus in three, suture can be successfully done, and if a similar examination the following morning yields the same result, the operation is carried out.

The simplest technique is employed. Attention is paid to accurate apposition of the skin margin, to obliteration of dead spaces, and careful cleansing of the skin. There are few cases in which the dressings need be touched before the seventh day, and as a rule at that dressing every second stitch is removed, the remainder being cut on the tenth day.

Of 290 consecutive gunshot cases during the past six months, 36 were sutured within five days of being wounded. Thirty-one of these were up to suture standard, of which 28 made a perfect recovery, being healed on an average of 10.5 days from the date of suture. The remaining three cases were partially successful. The use of Carrel's bacteriological standard was of the greatest value in the choice of wounds for delayed primary suture.

At no period is a wound so easily closed as it is before the onset of cicatrization and fixation of tissues in abnormal positions. Closure of a wound obviates the danger of secondary infection, the expense and pain of many dressings, and leads to the quickest and most perfect restoration of function. To be able to close wounds of soft parts and convert compound into simple fractures is the ideal of military surgery. That this has been attained in 10 per cent of cases recently arriving from the front is a tribute to the work of the casualty clearing stations.

V. C. HUNT.

**Hartwell, J. A.: The Chlorine Antiseptics in Civil Hospital Use.** *Ann. Surg.*, Phila., 1918, lxvii, 385.

The conclusions after four months' use of chlorine antiseptics at Bellevue Hospital are as follows:

The establishment of the Carrel-Dakin technique presents no undue difficulties.

The results obtained in military hospitals abroad can be duplicated in general civil hospitals in traumatic cases.

These antiseptics are not so efficient in controlling spontaneous infection.

Reasonable care prevents skin burns in all circumstances.

Dichloramine-T in either chlorinated eucalyptol or chloracosane is not a completely sufficient substitute for sodium hypochlorite solution.

The technique was entrusted to a special group of doctors and nurses and strictly adhered to. Cases upon which the treatment was used were fractures,

deep-seated infections, and superficial infections from burns. The progress of cases was followed by bacterial count of the wound, which was more accurate than depending on observation only.

Suppuration was controlled quickly in traumatic infection, but in burns and cases of infection from within, such as osteomyelitis, tenosynovitis, empyema, abscess of the lung, and abscess of the liver, it does not exert such an influence because the infective organisms are more deeply placed in the surrounding inflammatory zone.

No trouble was encountered from skin irritation. The surrounding skin was protected with vaseline gauze as described by Carrel. I. E. BISHKOW.

### ANÆSTHETICS

**Chaput, H.: Suppression of Chloroform Vomiting and Syncope by Discontinuous Chloroform Administration** (Suppression des vomissements et des syncopes chloroformiques par le chloroformisation discontinue). *Bull. Acad. de méd.*, Par., 1918, lxxix, 173.

Discontinuous anaesthesia according to Chaput consists in administering chloroform until there is a loss of consciousness equivalent to the appearance of sensory anaesthesia, then suspending the inhalations and proceeding with the operation until the patient shows signs of returning sensibility, when the same course is again adopted.

Discontinuous anaesthesia is superior to complete because it is absolutely benign and better supported. It is never accompanied by vomiting or by syncope; it is superior to local or lumbar anaesthesia because fear and anxiety are suppressed. Chlorethyl and ether discontinuous anaesthesia are unreliable.

Discontinuous anaesthesia is contra-indicated in patients with respiratory trouble, or in operations which require complete muscular resolution, such as fractures, luxation, etc. W. A. BRENNAN.

**Hyde, C. E.: Chloroform Poisoning.** *N. Y. M. J.*, 1918, cvii, 67.

The author reports the case of a patient who took two ounces of chloroform to induce sleep and who was discovered just in time to save his life. The patient was a male, thirty years of age, a private tutor, who was found in deep coma lying on his right arm. There was a marked odor of chloroform on his breath. Respirations were deep and gasping in character; the pulse was very weak, hardly perceptible; the pupils were widely dilated, with no reaction to light or accommodation.

Gastric lavage, and stimulation with strychnine and adrenalin and electricity were used with good effect. The patient regained consciousness after seven hours. The musculospiral paralysis of the right arm from pressure gradually recovered. An unusual feature of the case was the appearance of blebs filled with serum on the lower extremities; these were largest on the plantar surfaces of the feet.

ELLIS FISCHER.

### SURGICAL INSTRUMENTS AND APPARATUS

**Harris, W.: A New Apparatus for the Treatment of Foot-Drop.** *Lancet*, Lond., 1918, cxciv, 409.

This apparatus is used in the correction of drop-foot resulting from injuries to the sciatic and external popliteal nerves. A stout elastic is attached to the bottom two eyelets of the shoe. The elastic is supported by a strap passing up the trousers leg over the opposite shoulder with a strap about the waist to maintain its position. Patients suffering from drop-foot are able to walk with very little or no limp. It can be attached to any laced shoe.

P. W. SWEET.

**Broad, W. H.: A Pylon, or Temporary Artificial Leg.** *Brit. M. J.*, 1918, i, 453.

After amputation through the thigh or leg there is progressive diminution in the girth of the stump, consequently the bucket of an artificial leg will in a few weeks become loose.

It occurred to the author that the bucket of a temporary leg might be made of papier-maché, which could be broken up and replaced or remoulded periodically until the stump reached its minimal circumference.

An accurate cast of the stump up to the height of fifteen inches is taken in plaster of Paris and on this cast a layer of soft felt is sewn; this in turn is covered with a layer of papier-maché, about five-sixteenths of an inch thick. A wooden base is fitted to the floor of the bucket and the bucket is then reinforced by four light metal bars which are welded at their lower ends into a tube, into which is fitted the wooden peg. The leg provides an accurately fitting bucket for the stump which can be fitted as soon as the stump is healed. The pressure can be regulated by adjusting the thickness of the pad at the bottom of the bucket. The cheapness of the material permits of the renewal or remoulding of the bucket at a trifling cost. V. C. HUNT.

**Stansfeld, A. E.: An Apparatus for Transfusion of Blood by the Citrate Method.** *Lancet*, Lond., 1918, cxciv, 334.

The author uses blood containing 0.5 per cent citrate by allowing a 5 per cent citrate solution to mix with the blood in the proportion of one to nine.

The apparatus consists of a graduated receiver into which the donor's blood is withdrawn, and a burette from which a regulated flow of the citrate solution joins the current of blood as close as possible to its exit from the vein. The receiver is of 750 ccm. capacity. Both receiver and burette are supported upon a wooden stand, the two parts of which can be disconnected for convenience of packing. The receiver is fitted with a rubber cork through which passes a glass T-tube, one limb of which carries a piece of rubber tubing closed by a clip; the other is connected at first with a suction bottle and later with a double bellows pump. The suction bottle is a spare receiver, and from its lower end runs a piece of



rubber tubing which can be closed by a clip. The apparatus is supplied with needles of two sizes, the bases of which are ground to fit into a glass T-piece which is connected by rubber tubing to the receiver and burette. The receiver is sterilized by dry heat and the remainder of the apparatus by boiling or steaming.

The apparatus is fitted up with the suction bottle full of water and the burette with sterile citrate solution. The citrate is allowed to flow from the burette at the rate of three drops per second.

The veins of the donor and recipient are usually those at the bend of the elbow. A tourniquet is applied and the needle introduced into the vein of the donor; the citrate solution from the burette is allowed to mix with the blood in the proportion of one ccm. of citrate to 9 ccm. of blood. When the desired amount of blood has been withdrawn, the citrate is discontinued, the needle removed from the vein, and the tube from the receiver is clipped. The blood is then gently pumped into the recipient's vein.

V. C. HUNT.

## SURGERY OF THE HEAD AND NECK

### HEAD

**Richter, H. M.: Head Injuries; Demonstration of Two Cases.** *Surg. Clin. Chicago*, 1918, ii, 333.

All scalp wounds made by blunt force must be regarded as possibly accompanied by skull fracture or brain injury or both. Unless a condition of excessive shock prevents, immediate exploratory operation is advised without X-ray, unless immediately available. The scalp should be prepared as for a cranial operation, the wound disinfected, its edges excised, the underlying bone exposed and examined for fracture. If a foreign body is suspected, X-ray should first be taken.

If a fracture is present, the fragments should be elevated, hæmorrhage controlled and the wound closed without drainage, if it has been possible to excise all potentially infected tissue.

LISTER TUHOLSKÉ.

**Gage, H.: Some Observations on Injuries of the Head.** *Mil. Surgeon*, 1918, xlii, 276.

Injuries of the cranium are of importance only as they expose or injure the brain or its membranes. It is well to bear in mind that the cranium is a hollow shell with sufficient elasticity to bend and rebound, so that in the mechanism of injuries the lesion may be at the point of the blow or at a point opposite the point of contact, or the injury may result from the expansive force of a missile passing through the skull.

In mild cases, there is a partial unconsciousness from which it is possible to arouse the patient, followed by headache, dizziness, nausea and vomiting, and if the recovery is steadily progressive, it is considered a case of concussion. If the stupor persists and evidences of compression supervene, with delirium, slow pulse, restlessness and choked disc, it is considered contusion with hæmorrhage. Kocher views both these pictures as associated with hæmorrhage only of different degrees. In consideration of fracture of the skull, it is not of so great importance as to whether the fracture is compound, comminuted or simple, aside from the question of infection, as the amount of damage done to the brain and membranes. The danger of infection is always

greater in fracture of the base than in that of the vault.

In the diagnosis one should be careful to differentiate between an indurated edge of a simple hæmatoma of the scalp and a depressed fracture. Lumbar puncture is of value in diagnosing a laceration of the brain substance.

The immediate dangers of fracture are sepsis and hæmorrhage. The complications that may arise are paralysis, mental defects, and epilepsy. To avoid the later complications one should at operation, after elevating and removing all spicules of bone, observe the dura, and if there is no pulsation, and it appears dark or cloudy, incise for subdural hæmorrhage.

The following rules for operation are laid down:

In cases of localized pressure with symptoms of paralysis or cortical irritation, operate.

In every suspicious borderline case, incise the scalp to determine the condition of the skull.

In every depressed fracture, elevate.

In all depressed or perforating wounds, remove all spicules and leave the edge clean and smooth.

Remove all foreign bodies if they are likely to cause infection or if they are giving rise to symptoms.

In the present war, it is the practice to operate as soon as possible, but an attempt is made to get the case back to the evacuation hospital. All infected and devitalized tissues are cut away. The French are most radical, doing all that is necessary at the evacuation hospital. The French have been filling skull defects with pieces of cartilage removed from the cartilage of the ribs.

I. E. BISHKOW.

**Ochsner, A. J.: Clinical Observations Concerning Malignant Tumors of the Jaws.** *Tr. Am. Surg. Ass.*, Cincinnati, 1918, June.

This paper is based on the analysis of one hundred histories of patients operated upon for malignant tumors of the jaw by the author at the Augustana Hospital.

Especial stress is laid upon the importance of destroying the malignant growths very extensively, together with two centimeters of the adjoining tissue by the use of the actual cautery at the earliest

possible moment. Even in very early cases the cauterization should be done with great thoroughness. The cautery irons should be held in contact with the diseased tissue for a sufficiently long time to heat the tissues at a considerable distance from the point of contact.

Attention is drawn to the advantage of operating upon patients in the inverted Trendelenburg position, in order to reduce the amount of ether needed for anaesthesia. In order to reduce the secretion of mucus and the danger of inspiration pneumonia, a hypodermic of one-fourth of a grain of morphia and one one-hundredth of a grain of atropine is given one-half hour before the anaesthetic is commenced. The patient is anaesthetized in the horizontal position, and when thoroughly under the influence of the ether, the head of the table is raised to an angle of forty-five degrees and no more ether is administered during the operation.

The danger to the patient from metastases caused by the excision of portions of the growth or partial operation in the early stages of the disease is pointed out.

The patient is placed in the semi-sitting position in bed after leaving the operating table.

**Blake, J. B.: Recurrent Dislocation of the Jaw.**  
*Tr. Am. Surg. Ass., Cincinnati, 1918, June.*

Recurrent dislocation of the jaw occurs infrequently. It is a painful and disabling condition and tends to grow worse. Its treatment is essentially surgical.

Recurrent dislocation of the jaw should be treated by operation. The coronoid process, or the insertion of the temporal muscle into it, should be tied up to the anterior part of the zygomatic arch. This may be done with silver wire or with slowly absorbable suture material. The operation, though not so easy of execution as it sounds, is less difficult than the attack on the temporomaxillary joint, is much more logical, and more mechanically efficient; it does not injure important structures, and the scar is not disfiguring. The result should be one hundred per cent success.

Report of one case of serious and very frequent recurrent dislocation (the jaw dislocated forty to fifty times, and often several times in twenty-four hours), treated by the operation described, was a complete success, with an almost invisible scar.

**Speed, K.: Immediate Surgery of Gunshot Wounds of the Cranium; Reviewing 46 Craniotomies Within a Few Hours After the Reception of Wounds.** *Surg., Gynec. & Obst., 1918, xxvi, 396.*

Investigation of harmless appearing scalp wounds revealed three fractures in a series of 25 trial cases.

Excision of contused and simple infected scalp wounds affords opportunity for rapid and clean healing. Comatose cases are prepared immediately for operation. If the general condition is not good, stimulation precedes. The patients are given X-ray examination if time or conditions permit.

In investigating bone puncture or depression cases, care is taken to avoid any additional injury to the inner table or the extradural space, and to avoid opening the dura if the wound has not penetrated it. The operative field is kept clean by a stream of hot normal salt solution, which is used freely, and is effective in washing out foreign bodies and infectious material carried in by the missile. Foreign bodies easily accessible are removed, but track cleansing without foreign body removal should suffice if large intracranial vessels or the sinuses are endangered by manipulation.

The scalp should be closed completely by plastic manipulation to suit the individual case.

Observation of head cases causes the author to believe that hernia cerebri seldom follows early operation.

Depressed bone over a blood sinus is best left alone, rather than run the risk of exciting an uncontrollable hæmorrhage. Gauze packing or packing with a piece of muscle belly removed from another part of the patient is found to be effective in control of hæmorrhage.

In two cases of blood sinus injury the symptom of generalized muscular rigidity was notably present.

V. E. DUDMAN.

**Halstead, A. E.: Meningeal Cysts.** *Surg. Clin. Chicago, 1918, ii, 41.*

The author classifies meningeal cysts under two general heads: (a) those found at autopsy, which during life have produced no symptoms; and (b) those cysts which are known to follow definite trauma. These develop later in life.

He says that the relation of the cyst to trauma varies in individual cases. In some, the symptoms pointing to the presence of a cyst may be deferred for months or years after the injury, and these are known as traumatic meningeal cysts. When traumatic cysts follow close upon a trauma the mode of origin is easy to determine. Evidences of recent hæmorrhage are generally found with the cyst cavity and as a result of the effusion of blood the membranes have become separated. When the cavity has been gradually freed of the effused blood by a process of absorption of its cellular elements there remains a fluid which is identical with blood-serum, containing either a few blood-cells or blood-pigment.

In older cysts or those in which a considerable quiescent interval has elapsed between the injury and the formation of the cyst, the mode of origin is more difficult to explain. The presence of a low-grade inflammatory process, closing off a limited portion of the subdural or epidural space, is probably an important factor. Into these closed spaces an exudate takes place, probably from the perivascular lymph-spaces which remain open.

In old cysts where this inflammatory process has been active for a long time, the cyst wall becomes greatly thickened, and the rigidity which results unfavorably influences the prognosis after operation.



In traumatic meningeal cysts the symptoms are those of brain tumor. In the case which the author reports, headache followed by loss of vision were the only symptoms presented. Symptoms of cortical irritation may develop early or late. Halstead quotes a case in which jacksonian epilepsy began four years after a compound depressed fracture of the parietal bone, the result of a kick by a horse.

In general, two groups of symptoms may be described in connection with meningeal cysts: (1) Severe nervous symptoms may appear immediately or soon after the accident, convulsions, paralyses, prolonged coma, delirium, and focal symptoms, depending upon the site of injury. (2) The symptoms following the accident may be insignificant or absent. These may be only those that could be attributed to slight concussions, e.g., vertigo, headache, vomiting, etc. Months or years afterward serious symptoms may first become manifest. Headache, choked disc, vomiting with focal symptoms, including jacksonian epilepsy, may develop.

The early development of focal symptoms leads to early operation, and in this way gives a more favorable prognosis than when the symptoms are delayed. Halstead states that in the recorded cases the duration of the quiescent period has been as long as eight years.

As to surgical treatment, the procedure to be followed depends largely on the character of the cyst wall and the location of the cyst, particularly its relation to large blood-vessels. The ideal procedure in epidural cysts is to remove the overlying bone, excise the dural membrane forming the inner wall of the cavity, and fill in the defect left in the dura with a fascial transplant. The cranial defect may or may not be closed. In the majority of cases where there is no active inflammatory process found, there is no probability of hernia cerebri following. Unsightly depressions due to larger defects in the skull may be closed by bone transplant or by any of the other well established methods of closing these defects. As a general rule the skull defects should be closed some time after the primary operation for removal of the cyst wall and the closure of the dural defect.

The success of the operation in subdural cysts depends largely upon excision of a considerable part of the cyst wall and the filling of the cavity with some substance that will close the cavity temporarily, allowing the brain to gradually regain its normal contour, thus permanently obliterating the cavity. The most satisfactory method is to fill the cavity with a transplant of fat with sufficient fascia attached to close the defect in the dura. This fat, which is obtained from the thigh, is gradually absorbed, the brain expands as absorption progresses, and the cure is permanent.

The other methods which have been employed are: (1) puncture, which is invariably followed by a refilling of the cyst; (2) puncture and drainage, which in recent cysts may effect a cure. In older

cysts an essential feature, if cure is to be expected, is excision of the cyst wall.

Halstead reports a case of hernia cerebri over the occipital region accompanied by blindness and deafness in the left ear. This patient's only symptom was constant headache. Shortly after the onset of the headache, a decompression was performed. Six months after the operation a swelling began to form over the site of the decompression. One month later vision began to decrease and then the left ear became deaf. The Wassermann was negative on blood and spinal fluid. Globulin tests on spinal fluid were positive.

The patient was operated upon by Halstead. A large cyst was found between the temporosphenoidal lobe and the parietal bone. About 27 ounces of fluid were withdrawn from the cyst. The lining of the cavity was removed and the cavity filled by a transplant of fat and fascia. He does not report the final result.

G. W. HOCHREIN.

**Castex, M. R.: General, Differential and Etiological Diagnosis of Cerebral Tumors** (Diagnostico general diferencial y etiologico de los tumores cerebrales). *Rev. Asoc. méd. argent.*, Buenos Aires, 1917, xxvii, 770.

In the majority of cases of cerebral tumor there is a syndrome of endocranial hypertension which varies with the nature, localization, and development of the tumor. Evolution without signs of hypertension is less frequent and is more usually met with in cases of glioma, angioma, or hard sarcoma.

Hypertension is early and intense in tumors of the posterior cranial fossa. Headache, amblyopia, vomiting and vertigo are the cardinal symptoms. The first two symptoms are the most constant. Headache of itself is of little value as an aid to localization but amblyopia may be of diagnostic value. It is early and intense in the case of basal tumors and those of the posterior fossa; it may be absent or very slight in frontal and parietal tumors.

Local subcutaneous venous reticula, localized pain on pressure, ictus epilepticus, convulsions, disturbances in pulse, respiration, urinary function, or temperature, while confirmatory, are less important than the foregoing signs.

The diagnosis must be differentiated principally from syphilis and will depend chiefly on the history and existence of syphilitic indications. The hematologic signs and alterations in the spinal fluid are very untrustworthy and the author, after trying them in a very large number of cases, has concluded to rank them as of no diagnostic value. This includes the Wassermann and Nonne-Appelt tests.

Pseudo-cerebral tumors are almost without exception due to hereditary syphilis. In them symptoms of cortical and focal irritation are less frequent than in true tumors.

General progressive paralysis is clearly distinguishable on accurate study of the history and symptomatology. Cerebral abscesses are always



secondary to otorrhœa, sinusitis, or traumatism. Cranial puncture will decide the diagnosis in such cases.

Tuberculomata may be diagnosed from the antecedents, and other bacillary locations. Cranial puncture will give a histologic or bacteriologic diagnosis. Cranial puncture is the only method which permits a differential diagnosis from circumscribed serous meningitis. W. A. BRENNAN.

### NECK

**Haynes, R. S.: The Differential Diagnosis of Enlargement of the Cervical Lymph-Nodes.** *N. Y. St. J. Med.*, 1918, xviii, 91.

According to Haynes, enlargement of the cervical lymph-nodes is among the commonest of the affections of childhood. It is most commonly secondary, but may be primary.

Enlargement of the cervical lymph-nodes may be divided into: (a) inflammations, simple or tuberculous; (b) hyperplasias; and (c) neoplasms. In making this classification one must bear in mind that these pathological processes do not adhere consistently to particular disease entities, but that both hyperplasia and inflammatory swelling may result from infection; and that a neoplasm may become the seat of active inflammation.

In making the differential diagnosis one should ascertain the character of the malady, the primary source of infection if one be present, and the type of infection. One should also make a careful study of the patient's history, paying particular attention to the conditions under which he lives. He lays particular stress on the fact that in differentiating from syphilis one should remember that the enlargement of the cervical nodes which occurs in syphilis is part of a general adenopathy affecting the liver, spleen, inguinal and epitrochlear nodes, and that the history of miscarriages, stillbirths and early deaths in the family is of importance.

He discusses the anatomy of the cervical region, which is of importance to surgeons.

He says that the differentiation between simple and tuberculous infections is sometimes very easy and often very difficult. In children under two, an adenitis is more apt to be simple than tuberculous. When the enlargement is due to pyogenic infection, there is likelihood of evidence in the mouth, throat, or nasopharynx of inflammation of the structure in these localities. The absence of such in the presence of cervical swelling is significant of tuberculosis. Usually with pyogenic infections the swelling is larger, comprises more lymph-nodes, has more perinodular swelling, is tender, reddened, hot and elastic, all the tissues being bound up in the swelling. In the later stages of tuberculous enlargement there may be just as many glands enlarged, there may be matting together and adhesions to the skin and deeper parts, but only exceptionally will there be much tenderness, redness or heat. Softening, if it occurs, will point and discharge and subside if

the process is pyogenic, while sinuses will persist if it be tuberculous.

Examination of the blood should show a polynucleosis in the pyogenic, and a lymphocytosis in the tuberculous enlargements, but this rule is not absolute.

The tuberculosis complement fixation test should be positive in the tuberculous enlargement and negative in simple adenitis. It may nevertheless be positive in simple adenitis when there are foci of tuberculosis elsewhere. A negative von Pirquet reaction is a very valuable evidence of pyogenic infection. It is also of considerable value when positive in children under five years. It may be truthfully stated that under five years the coincidence of a lymph-node enlargement and a positive von Pirquet reaction is very good evidence that the enlargement is tuberculous in nature.

Roentgen ray examination of the head, if it discloses tooth abscesses, will be of help in placing the stamp of a pyogenic infection on a questionable enlargement; if it discloses calcareous deposits within the area of the cervical enlargement, it will point toward tuberculosis. Examination of the thorax showing extensive tuberculous involvement would offer corroboration that a similar condition was present in the cervical lymph-nodes.

The evidence obtained from the examination of excised adenoids and tonsils may very often be inconclusive. Tuberculosis of a tonsil may not be evident without prolonged serial examination. Tubercle bacilli may be obtained from aspiration of softened areas of the enlargement mass. Softening, however, is a condition one should feel ashamed to have supervene in cases of cervical adenitis which are under his care.

With all these diagnostic factors considered, excision may be necessary to verify the differential diagnosis. G. W. HOCHREIN.

**Voorhees, I. W.: Cervical Gangrene Complicating Ludwig's Angina.** *Laryngoscope*, 1918, xxviii, 177.

The case reported by the author was that of a man aged fifty-one who developed a swelling under each side of the inferior maxilla corresponding to the site of drainage from the lower canines which were infected and extracted. The cervical swelling continued so that two external incisions at a weekly interval were made, the first parallel with the lower border of the maxilla, the second just above the clavicle. Necrotic tissue kept sloughing away, exposing the maxilla, but finally the wound became clean and healing occurred. OTTO M. ROTT.

**Pfahler, G. E.: Roentgenotherapy in Cervical Adenitis.** *N. Y. St. J. Med.*, 1918, xviii, 99.

Pfahler quotes many authorities to show the increasing frequency of cervical adenitis. As a result of his investigations he believes that more attention should be given to the subject than heretofore. He believes that each case should be studied individually and the source of infection searched for and



treated. Diseased tonsils should be removed and diseased teeth treated.

If the glands are soft, fluctuating or tender, at least the affected soft gland should be incised and drained. If the case is of recent origin and the glands are not soft, he believes that in the majority of instances the glands can be made to disappear under the influence of roentgen rays properly administered. Whenever a child is operated upon for cervical adenitis, the operation should be followed by at least one or two full courses of postoperative X-ray treatment. The hygienic conditions under which the patient is living should be improved as much as possible, and good food, fresh air, and tonic treatment will be beneficial.

His technique of roentgenotherapy is to employ hard rays thoroughly filtered, using a tube which will back up a nine-inch parallel spark gap, which is equivalent to approximately nine on the Benoist scale. These rays are filtered through six millimeters of aluminum. He applies the rays for forty milliamperes minutes through each portal of entry, protecting the hair and face by sheets of lead. The focal distance from the target to the skin is eight inches.

He calls attention to the necessity of avoiding a dermatitis or a subsequent telangiectasis, and emphasizes the fact that if roentgenotherapy is to be employed in cases of cervical adenitis, it should be done by a skilled roentgenologist who understands the importance of measuring his doses, of giving sufficient treatment to produce results and yet not enough to damage the skin; it should not be given by a nurse or an orderly.

He makes the following conclusions:

1. Cervical adenitis is a frequent disease and deserves more serious consideration.
2. Each case should be studied as an individual, and every means employed that will produce beneficial results.
3. Roentgen rays can be expected to relieve completely the early cases.
4. Softened glands should be opened and drained as abscesses.
5. Patients who have been operated upon should receive postoperative treatment to prevent recurrences.
6. These cases require skillful technique, whether it be surgical or roentgenological.

G. W. HOCHREIN.

**Beebe, S. P.: Ten Cases of Thyroid Disease.** *Med. Rec.*, 1918, xciii, 705.

It is the purpose of the author in presenting ten cases of thyroid disease to illustrate some of the conditions that demand relief, and to describe in some detail the methods that have been followed in their treatment. In his experience no one method is suitable for all cases and the good effects as well as the limitations of methods now in common use will best be presented with actual cases to serve as a text. The history of the cases is fully given with

the method and kind of treatment instituted in each case cited.

Beebe has discussed the relation of nose and throat infections to the development of goiter in a previous publication, but approximately 40 per cent of the cases that have come under his observation have shown such coincidence.

The author has seen four cases of extremely toxic menstrual periods complicating Graves' disease. The history of one is fully given. All were women over forty years of age. In the second the ovaries were removed by vaginal section. The case made a complete recovery, and is now well. In the two others the condition was controlled by active treatment of the lower pelvis with X-ray. While somewhat slower in operation, this procedure has been found equally effective. In the operated cases the ovaries were found to have many small cysts.

The menstrual function is often disturbed in hyperthyroidism; in most cases the gland becomes more swollen, all the symptoms of the disease are more pronounced during this time, but extremely toxic periods are quite uncommon. It is, of course, not unusual to find a complete cessation of the periods during the more active stages of the disease.

It has been observed by many men that dietary conditions have an important bearing in both etiology and treatment. Watson has found that rats fed on a meat diet show thyroid hyperplasia. The relation of toxins from the intestinal tract to the origin and maintenance of hyperthyroidism has been emphasized by many authors.

Beebe believes that there is danger in dealing with these cases from a one-sided standpoint or a pet theory to the neglect of obvious fundamental conditions of common-sense treatment.

Iodine, X-ray, diet and clean bowels will relieve a large percentage of some cases, but no attempt should be made to do it in a few weeks. A gradual change is much safer for the patient. The iodine should be continued in such cases in spite of mild hyperthyroid manifestations.

Simple colloid goiter is not necessarily a surgical condition according to the author's belief. No type of thyroid enlargement is normal and it should not be slightly treated. Cases of the sort mentioned very frequently show at a later stage the characteristic manifestations of severe thyroid disease.

Cancer of the thyroid is nearly always superimposed upon a goiter of some years' standing. In other cases that have come under the author's observation, thyroid enlargement without marked symptoms had been noted for several years before the change to a malignant condition was observed. In most cases thyroid carcinoma grows rapidly when once initiated, so that a period of nearly three years between operation and fatal outcome is quite unusual. Beebe has had four cases with early operation for cancer of the thyroid but no after-treatment, and death followed in all of them in less than one year and in each case there was extensive recurrence and infiltration at the site of operation.

Thyroid hyperplasia, giving rise to the symptoms recognized as Graves' disease or exophthalmic goiter, has not, in the author's observation, given rise to a later malignant growth. While the carcinomatous thyroid undoubtedly has some true thyroid function, as evidenced by the myxoedematous symptoms following its removal and by the occasional observation of relief from such a condition when metastases have developed, it does not appear that the excessive activity found in Graves' disease has ever been noted in such glands. Any successful treatment of thyroid carcinoma must be prophylactic rather than curative.

Beebe desires to emphasize that each case is a problem in itself and requires a careful analysis of all the factors involved, to get the best results. Medical treatment is not a spectacular method, and the long-continued action of mild corrective measures is advisable. The gland is responsive to a variety of disturbing conditions, and no method of treatment, medical or surgical, that confines its action to a direct assault on the gland and does not remove the factors which disturb its normal functioning, can succeed in practice. E. C. ROBITSHEK.

**Mayo, C. H.: The Principles of Thyroid Surgery.** *Tr. Am. M. Ass., Sect. Surg. General & Abdom.,* Chicago, 1918, June.

The thyroid undoubtedly is one of the most important glands in the body, and while a complete knowledge of its activities is still lacking, the work of Plummer and Kendall, through investigations into the physiologic action of its secretion, is such as to nearly accomplish the realization of its fundamental effect on life. Kendall has been able to separate the compound of the thyroid containing iodine from the balance of the gland. This is accomplished by destroying the proteins of the thyroid by means of boiling with a strong alkali,

which does not decompose the iodine-containing compound, and, by suitable treatment, it can be separated as a pure crystalline substance containing 65 per cent of iodine; its formula is  $C_{11}H_{10}C_3Ni_3$ . The compound contains an organic nucleus called indol, as well as oxygen. Investigation of the activity of the gland shows that the iodine is not directly involved in the functioning of the substance but merely increases its power to react.

Plummer, from a clinical standpoint, in the observation of many thousands of cases of goiter, numerous cases of cretins and of myxoedematous patients, has shown that the rate at which energy is produced by the animal organism is controlled by the amount of thyroxin which is acting within the cells of that body. While not the only factor influencing the rate at which one lives, it probably has more to do than any other substance with the governing of the speed at which energy is produced in the body. Plummer shows the average basal metabolic rate of exophthalmic goiter patients at the time of coming under observation to be 52 per cent above normal, and the average rate in those in whom ligations were done and who returned in three months to be plus 39 per cent. The average metabolic rate eighteen days after thyroidectomy is plus 19. Ligation probably causes the metabolic rate to drop approximately 20 per cent. Other factors being constant, the total energy output of the body varies with the amount of thyroxin in the tissues and the rate of excitation.

In persons under twenty-five years of age, small adenomata in the thyroid and the simple colloid goiters are only occasionally recommended for surgery. Later in life, the degenerations which occur in goiters of long standing, such as encapsulated adenomata and encapsulated colloid areas when the secretion has become reduced, may develop thyrotoxic conditions.

## SURGERY OF THE CHEST

### CHEST WALL AND BREAST

**Mabee, O. R.: Duct Papilloma and Duct Carcinoma of the Breast.** *Canad. M. Ass. J.,* 1918, viii, 225.

The author reports eight cases of duct tumors of the breast in a total of 529 breast tumors examined in the department of surgical pathology at the Toronto General Hospital during the last ten years. In this series of cases, five were duct papilloma and three duct carcinoma. Seven occurred in married women and 75 per cent of these were in parous women. Their ages varied from thirty-six to fifty-two years.

Physical examination showed a tumor situated usually centrally in the breast, but sometimes, as in two cases, at some distance from the nipple. They

varied in size from a pigeon's egg to that of a small orange. In the benign cases the mass was localized, slightly irregular and moderately firm. Two of the malignant cases showed extensive infiltration of the surrounding breast tissue and gland metastases; the other malignant case showed an oval mass the size of a hen's egg and its malignancy was only determined by the microscope. Retraction of the nipple and dimpling of the skin were present in only one of the malignant cases. Pain was present in four cases, being most marked in the malignant cases. Bloody discharge from the nipple was present in five cases.

The tendency of duct papilloma of the breast to undergo malignant change argues against conservative surgery in these cases. At least a simple amputation should be done in cases which show



no clinical evidence of malignancy. In the malignant cases the more radical the operation, the less liability of recurrence there will be. In doubtful cases, the microscopical examination will be the guide as to how radical the operation should be.

E. B. FREILICH.

**Meyer, W.: Postoperative Thoracic Drainage.** *Tr. Am. Surg. Ass., Cincinnati, 1918, June.*

It is a matter of self-understanding that the surgeon will in the course of his intrathoracic work come across cases in which he finds drainage of the chest imperative.

If he does drain, postoperative acute pneumothorax with its serious sequela is the inevitable consequence.

It was but natural that surgeons tried to find ways and means to drain the pleural cavity and incidentally try to avoid the threatening subsequent acute pneumothorax.

It is emphasized by the author that the treatment of empyema is excluded from this discussion.

The problem of postoperative drainage, avoiding at the same time the collapse of the lung, was solved by the author in 1911. He kept the patients after the operation under differential air pressure for fifteen to twenty hours; having drained the chest with cigarette drains and rubber tubes through a stab, after closure of the incision in the same fashion as is customary when draining an infected intra-abdominal field. The stab was made in the ninth or tenth intercostal space in the scapular line. Tube-ends and the non-voluminous dressings outside were covered with a large piece of rubber dam. The latter is of importance; it works as a valve which prevents the entrance of air into the chest after the patient has been removed from the differential pressure apparatus. Very satisfactory results were obtained with this method of postoperative thoracic drainage. However, it is rather cumbersome, inasmuch as two or three special nurses are needed for carrying out the after-treatment.

Tiegel of Dortmund proposed a special metal drain with a rubber dam cover outside, the latter acting as a valve. He personally has seen good results in using it.

In endeavoring to simplify postoperative thoracic drainage, the author struck on Kenyon's method, which consists in pushing a rubber tube through a small incision in the intercostal space in air-tight fashion into the pleural cavity and holding it firmly in place by special device. The outer end is then connected with a bottle partially filled with fluid under the bed. An interposed glass tube allows one to watch the characteristics of the drained fluid. The apparatus works by syphonage; it allows the exit of the fluid from the chest and prevents the return of air into the same. The lung can thoroughly distend and incidentally effused fluid be drained off.

The author has tested this method in six cases of intrathoracic operations, namely, on lungs, ex-

ploratory thoracotomy for œsophageal carcinoma, resection of the chest wall, etc., with very satisfactory results. He considers this simple method very promising for quickly pushing ahead successful results of intrathoracic operations and advocates the application of the same in every case of such interference.

Attention is also drawn to the fact that the frequent, often deadly pressure-pneumothorax following a so-called internal injury, after crushing of the chest, may be successfully overcome by this simple method.

**Whittemore, W.: The Surgical Treatment of Empyema.** *Boston M. & S. J., 1918, clxxviii, 360.*

Whittemore finds that the old rib resection and tube drainage for empyema is followed by a mortality of about 20 per cent. This at least is the experience at several large eastern hospitals. Furthermore, cases that survive the operation are prone to become chronic. The lung in its more or less collapsed condition becomes covered with a thick pyogenic membrane and cannot expand. It seems very probable that one important cause for the failure of the lung to expand is the positive pressure through the drainage tube. At any rate the high mortality and the large per cent of chronicity following this operation leaves much to be desired.

Lilienthal's operation, in which the whole thoracic cavity is opened wide by rib spreaders, after a long intercostal incision, is the operation of choice in all acute cases. Adhesions are broken up, pyogenic membrane covering the visceral and costal pleura is removed, allowing the lung to expand fully. The wound is then closed tight except for a rubber tissue wick at either end of the incision. There is surprisingly little shock following such an operation, the patient is more comfortable than following any other type of operation for empyema, and the convalescence is much shorter. All drainage is removed in a week to ten days. Whittemore has done this in 12 cases, and all have done well except one baby who died two days following operation from cerebral embolus.

In desperately ill patients it may be necessary to do a preliminary drainage operation to tide the patient over. Whittemore has used with good success a large catheter inserted through a large trocar and sutured in place, the trocar being withdrawn. The end of the rubber tube attached to the catheter is kept in a bottle under water to prevent air entering the pleural cavity. After several days suction is used to aspirate the remaining exudate. When only two ounces are obtained in twenty-four hours, all apparatus is removed.

In encapsulated empyema exploratory rib spreading thoracotomy should be done. The guide to a small amount of encapsulated pus is adhesions. The pleura should be protected by walling off gauze before opening into the abscess. Wide open thoracot-

omy should be done under positive intratracheal pressure as this will prevent collapse of the lung when there are no adhesions and it will aid in expanding the lung when already partly collapsed. The patient should be in a prone position.

In the chronic cases in which the cavity is lined with a thick pyogenic membrane, the best treatment is a combined Schede and a complete decortication of the lung and excision of the parietal pleura. The wound is closed tight except for a small rubber tube at one angle. The rubber tube is tied off and opened only after forty-eight hours to allow accumulated serum to drain off. It is then tied again. Some simple drainage operation may be necessary as a preliminary step to this radical procedure.

Paravertebral anaesthesia is the most satisfactory regional anaesthesia. Intratracheal ether is the best form of general anaesthesia. It gives enough pressure to expand the lung and is not followed by bad results.

C. A. HEDBLUM.

### TRACHEA AND LUNGS

**Grant, J. D.: A Case of Pretracheal Abscess of Acute Development, Producing Dysphagia and Dyspnoea.** *Proc. Roy. Soc. Med.*, 1918, xi, Sect. Laryngol., 72.

A woman, aged forty, was seen by the author complaining of occasional loss of voice for the past two years. Examination of the nose and throat revealed a perforation of the quadrilateral cartilage from a simple ulcer, and active lupoid ulceration on the anterior edge of the right inferior turbinate. The larynx was normal, with the exception of paresis of the internal tensors of the cords.

A solution of chloride of zinc was applied to the vocal cords and a nasal wash was ordered. Two weeks later she showed a painful swelling in the neck, difficulty in breathing and pain on swallowing. Examination at that time found the larynx in the same condition as before, but there was a red tender swelling over the region of the thyroid body. On the following day the abscess was opened and the pus evacuated.

The pus contained some streptococci and staphylococci, but no tubercle bacilli. After ten days the wound had practically healed. The author was unable to trace the cause of this abscess.

E. B. FREILICH.

**Milligan, W.: Fracture of Four Rings of the Trachea; Urgent Dyspnoea; Operation; Recovery.** *Proc. Roy. Soc. Med.*, 1918, xi, Sect. Laryngol., 54.

The author reports the case of a female munition worker whose scarf was caught in rapid revolving machinery, all but strangling her. Urgent dyspnoea, pain in the neck, and a bloody expectoration followed. A tracheotomy was performed and four tracheal rings were found fractured. Tracheal

stenosis followed as a sequela and bronchoscopic tubes of increasing size were used to dilate the stricture.

H. H. FREILICH.

**Lapointe, A.: Extraction of Intrapulmonary Projectiles** (A propos de l'extraction des projectiles intrapulmonaires). *Bull. et mém. Soc. de chir. de Par.*, 1918, xlv, 152.

Lapointe has made 19 deferred extractions of pulmonary projectiles. In 5 cases he tried Petit de la Villeon's method by forceps extraction under continuous guidance of the radioscopic screen. He succeeded only in 1 case and had to terminate the other 4 by thoracopneumotomy. In the remaining 18 of his 19 cases therefore he proceeded by thoracopneumotomy, using the radioscopic screen for control. He does not think it is necessary to make a large thoracic flap in any case or even a costal resection in many cases. In young patients an intercostal incision of 10 to 15 cm. made in the anterolateral part of the thorax with the use of a good retractor allows the introduction of the whole hand into the thorax. In this way Lapointe has made 5 extractions by the anterior or lateral route on a free lung.

The intercostal incision gives access to the phrenic center without costal resection. Near the sternum, where the ribs are easily separated, section of the third cartilage enabled Lapointe to remove a bullet from the right lung. Thus costal resection is far from being always necessary in deferred extractions of lung projectiles and may very often be omitted in early extractions when there are neither adhesions nor thoracic deformation.

Lapointe's 18 pneumotomies included 10 extractions in cases of a free lung or a lung freed of adhesions by the fingers; and 8 extractions in cases of a fixed lung. After finding and extracting the projectile he, like Duval, always sutures the torn lung and seals the thorax hermetically by suturing the muscles and skin. Recently he has omitted aspirating the air left in the pleural cavity, as it gives no trouble. This operation which Lapointe has done in 10 cases is the ideal pneumotomy, Duval's operation, omitting the employment of a compass and in half of the cases omitting costal resection.

All 19 patients referred to recovered without serious incident. Among the 10 cases with the free lung, 8 cicatrized *per primam* and the majority left the hospital within twenty-five days after pneumotomy. In a few cases however the wounds were not completely cicatrized until four months later.

The 8 operations on a fixed lung without exteriorization or pulmonary suture progressed also without serious postoperative incident.

In a word, thoracopneumotomy under the control of the radioscopic screen has given the author every satisfaction in late extraction of intrapulmonary projectiles. There was no mortality and no serious complication in 18 cases.

W. A. BRENNAN.



## HEART AND VASCULAR SYSTEM

**Delbet, P.: Clinical and Operative Study of Foreign Bodies in the Heart** (*Étude clinique et opératoire des corps étrangers du cœur*). *Paris chirurg.*, 1917, ix, 525.

Delbet gives the full clinical details of the case of a soldier with an intracardiac foreign body which he successfully operated upon. The case was briefly referred to some time ago by Delorme. In addition, Delbet makes a historical review of cardiac surgery from the earliest time.

In Delbet's personal case the intracardiac position of the projectile was assured by repeated radiologic examinations. As it was apparently well tolerated, the wisdom of surgical intervention was doubtful, but the man's condition grew worse and it was decided to operate.

An H-incision was made at the left sternal border, the vertical cut being 1 cm. long and the two transversal being about 6 cm. and 10 cm. respectively. On cutting down and sectioning the ribs, the pericardium was found intimately adherent to the heart but was easily detached by the finger. The heart was explored and the foreign body easily located embedded in the middle part of the right ventricle. Delbet wished to exteriorize the heart through the thoracic opening but had to enlarge this in order to do so. The heart, seized in the operator's left hand, was brought out through the wound. He found that the ventricle was soft and depressive and could be folded between the fingers. He decided therefore to take advantage of this in order to squeeze the projectile toward the outside, and while effecting hæmostasis with the pressing fingers, to incise the edge of the fold and extract the foreign body.

This maneuver succeeded admirably. The right edge of the heart was incised for about 3 cm. Only a few drops of blood escaped. A Kocher forceps was introduced into the incision and the foreign body rapidly seized and withdrawn. Three sutures with No. 2 catgut were immediately placed, reinforced, and the heart returned to its place. The thoracic wounds were hermetically closed without drainage.

The operation lasted three-quarters of an hour. The piece of projectile extracted was an irregular cube of steel, 1½ cm. to a side. It weighed fourteen and one-half grams. The postoperative course was good and the man was up three weeks after operation. He had made a perfect recovery five months later.

Delbet refers to the literature of heart wounds, both in ancient authors commencing with Hippocrates, and in the anatomoclinical period beginning with Ambroise Paré. A third period opens with Larrey, the period of medical treatment. The modern period commences with Delorme's "*War Surgery*" in 1915 in which he recommended that suture of heart wounds, though difficult, should be attempted. It had been done experimentally. Contemporary surgery has gone even further. Not

content with stopping hæmorrhage, it has endeavored to remove foreign bodies and to remove consecutive pericardial adhesions.

Delbet takes up the detailed study of foreign bodies and adhesions. Foreign bodies in the heart are in general well tolerated; their extraction is only exceptionally indicated. Of all heart injuries seeking surgical aid, as gathered in the medical statistical literature, about 10 per cent have a foreign body in the heart. Thus Fischer's statistics of 401 cases give 47 with a foreign body.

A foreign body may be lodged in any cavity of the heart, the auricle or ventricle, right heart or left heart. The author gives tables to show that projectiles of war, like other foreign bodies, principally occupy the ventricles, the right somewhat more frequently than the left.

It seems almost impossible that the heart should be attacked without a concomitant wound of the lungs or pleura. Nevertheless such cases are not frequent.

Massive infections of the pericardium are rare. In old cases the formation of adhesions is very often met. Internal inflammatory reactions are rare and it was noted in several autopsies that internally the heart did not show any visible alterations.

The article is to be continued in a later issue, taking up the question of adhesions.

W. A. BRENNAN.

**Debeyre, A.: Late Migration of a Bullet from the Inferior Vena Cava to the Right Ventricle; Section of the Renal Pedicle** (*Migration tardive d'une balle de fusil, de la veine cave inférieure au ventricule droit; section du pedicule rénal*). *Bull. et mém. Soc. de chir. de Par.*, 1918, xlv, 442.

The case reported by Debeyre is curious and rare. The facts were established at the autopsy of a soldier dying a few months after having been shot in the lumbar region.

The trajectory of the bullet apparently was through the anterior face of the right kidney, gliding along the vascular pedicle of the kidney and penetrating the externoposterior part of the inferior vena cava. The renal artery was obliterated. The bullet had apparently remained quiescent in the vena cava for about six weeks, then migrated to the auricle, then fell into the right ventricle and remained fixed in it between two small projections in its antero-inferior part.

W. A. BRENNAN.

## PHARYNX AND ESOPHAGUS

**Matlack, J. A.: Roentgen Diagnosis of Lesions of the Esophagus.** *Colorado Med.*, 1918, xv, 94.

The advantages claimed by the author for the roentgen method of examination of lesions of the esophagus are greater ease, simplicity and accuracy, and less discomfort to the patient than with the older methods. The opaque meal is observed as it passes down the esophagus with the patient in the

oblique diameter in back of the fluorescent screen. Extrinsic and intrinsic obstructions may thus readily be observed. Benign constrictions are usually less irregular and less extensive than malignant. Diverticula may be seen as rounded sacs. In cardiospasm

the cesophagus appears as a fusiform sac of regular outline and more or less dilatation. In all cases final interpretation of the roentgen findings must be made only after careful consideration of all available clinical data.

ADOLPH HARTUNG.

## SURGERY OF THE ABDOMEN

### ABDOMINAL WALL AND PERITONEUM

**Mayo, W. J.: Secondary Tuberculous Peritonitis; Its Cause and Cure.** *Tr. Am. M. Ass., Sect. Obst., Gynec. & Abdom. Surg., Chicago, 1918, June.*

Tuberculous peritonitis is not a primary disease, but like septic peritonitis is symptomatic, having its origin in some local focus of infection. The most common sites of such local foci are the fallopian tubes in women, some part of the intestinal tract in both women and men, and the lymphatic glands and channels, especially in children. Occasionally, the primary focus will be found in the stomach, the spleen, the liver, the gall-bladder, or the genito-urinary tract. To consider tuberculous peritonitis as an entity or to treat it as such leads to confusion, whereas if it is looked on as a secondary process, due to some primary focus, one is led to search for the primary focus and to direct treatment leading toward cure.

In tuberculosis the fimbriated extremities of the fallopian tubes are usually open, quite the opposite from the condition that exists in gonorrhoeal infection, in which they are closed, forming pus tubes. In tuberculosis the material from the tuberculous process passes out from the open fimbriated extremity of the tube into the abdominal cavity, causing a more or less generalized peritonitis. Such peritonitis is essentially a conservative process leading to the destruction of the noxious agents. When the source of the infection can be removed, the peritoneum returns to normal. Simple laparotomy sometimes cures the peritonitis when tapping would be of no avail, because when the fluid is completely removed from the peritoneal cavity, as by operation, the fimbriated ends of the tubes, which had been mechanically separated by the fluid from the surrounding tissues, may become adherent to neighboring structures, thus closing the ends and preventing further leakage, and tuberculous pus tubes result with few symptoms.

Present knowledge of tuberculous peritonitis, the result of tubal disease, is fairly adequate, but when the local lesion is elsewhere, great difficulty may be experienced in locating and removing the primary source of the peritoneal infection. Rarely in the author's experience has the appendix been the cause of tuberculous peritonitis. Tuberculosis of the ileocaecal coil, especially of the hyperplastic type, is often accompanied by tuberculous peritonitis which as a rule is limited to the immediate vicinity of the

primary disease, and the removal of the involved bowel promptly cures. This is equally true of localized tuberculosis of the small intestine.

In a considerable number of cases of peritoneal tuberculosis confined to the region above the transverse colon, the lesion was particularly marked in the vicinity of the gall-bladder and the pyloric end of the stomach. In several of these cases the gall-bladder, which had shown cholecystitis, was removed and the patients were cured.

The possibilities of the cure of tuberculosis of the peritoneum by simple laparotomy, when the local focus cannot be discovered and removed, are limited to the ascitic forms of the disease. It may at least be said that an open operation with careful removal of all fluid, with or without medication, has therapeutic value. It would seem, however, that the surgical profession has been over-enthusiastic in its praise of the simple operation. The fibroplastic types are benefited only if there are sacculations containing fluid, but operation is contra-indicated when the adhesions fill the entire abdomen without collections of fluid or if the collections consist of multiple small pockets filled with turbid tuberculous exudate containing a mixed infection. Operation in these cases with separation of adhesions is of little value and often results in intestinal fistulæ. Fortunately the adhesion type of tuberculosis of the peritoneum giving rise to the swollen, hard or "wooden" abdomen is most favorable for spontaneous cure.

**Urrutia, L.: Diaphragmatic Hernia of the Stomach** (Hernia diafragmática del estomago). *Arch. españ. de Enfer. del apar. digest.*, Madrid, 1918, i, 5.

Urrutia reports a case of diaphragmatic hernia in a man of thirty-five years. He gave a history of having been stabbed in the chest four years before. Operation was done by the abdominal route following the Bevan technique. The greater part of the stomach, the omentum, and the transverse colon not including the splenic angle had herniated through an old diaphragmatic orifice. All the herniated organs were held firmly by adhesions to the surrounding parts. In this case the history and the physical findings suggested the diagnosis of diaphragmatic hernia which was verified by an X-ray examination after a test-meal. The man recovered.

Giffin in 1912 collected 650 cases of diaphragmatic hernia, in only 15 of which was a correct diagnosis made during life.



The author discusses the reasons why the thoracic route has been preferred by most authors in operating for diaphragmatic hernia. It has been to a great extent due to German surgical teaching. In America, however, Bevan has recommended the abdominal route except in certain cases. The author prefers this route as more rational and less traumatizing, not requiring resection of a single rib nor collapse of a lung. He was decided in adopting this course by reading Balfour's case of traumatic hernia of the stomach and colon published in the *Annals of Surgery*, January, 1917, operated upon by the abdominal route in which reduction was made without the least difficulty.

The author used the ample incision of Bevan, maintaining the diaphragm tense by means of strong traction on the left costal border with a wide retractor and employing the "pedal" needle devised by Chaput. Heavy chromic catgut was used.

W. A. BRENNAN.

**Bland-Sutton, J.: Ganglion Neuroma of the Mesentery.** *Lancet*, Lond., 1918, cxciv, 429.

The author reports a case of large abdominal tumor in a boy of ten which was found to be encapsulated between the layers of the mesentery. It was as large as a coconut and firm and yellowish like a uterine fibroid, but soft in the center. Microscopical examination revealed nerve-cells and medulated nerve-fibers throughout the soft core and the more firm cortical portion.

The literature describes ganglion neuromata in connection with the adrenals but there was none in this instance. Ganglion neuromata are more common in children than adults, and in the mesentery during childhood and adolescence are always benign.

Ganglion neuromata of the adrenals are malignant and contain disseminating undifferentiated sympathetic neuroblasts; they are called neuroblastomata. Some ovarian and testicular teratomata contain nerve tissue indistinguishable from the gray matter of the brain. The majority of such are innocent, but some display malignancy. It is not improbable that these are embryomata in which the neuroblastic tissue predominates.

P. W. SWEET.

#### GASTRO-INTESTINAL TRACT

**Wilensky, A. O., and Thalhimier, W.: The Etiological Relationship of Benign Ulcer to Carcinoma of the Stomach.** *Ann. Surg.*, Phila., 1918, lxxvii, 215.

In this study an effort was made to ascertain whether a microscopical study of a series of benign and malignant ulcerations of the stomach would throw any light on the subject of the relationship of ulcer to carcinoma. There were difficulties encountered in that there is a lack of experimental means for causing chronic gastric ulcers in animals.

Forty-eight ulcerated lesions of the stomach were studied. This includes 39 chronic ulcers, 7 ulcer-like carcinomatous lesions, 1 ulcer with regional carci-

nomatous lymph-nodes, 1 mixed lesion resembling an ulcer, but with carcinoma at many places on its periphery. There were also studied 5 gastrojejunal ulcers and two healed ulcers.

The following conclusions are drawn:

Absolute proof has not been furnished that carcinoma of the stomach can arise in a pre-existing ulcer. Evidence has been submitted which indicates in all probability that in one specimen out of the forty-eight there is present a carcinoma arising in an ulcer. It is fair to presume that in 1 to 2 per cent of ulcerated gastric lesions the morphological microscopic evidence indicates that carcinoma has arisen in an ulcer.

The majority of ulcerated gastric lesions are either simple chronic ulcers or definite carcinomata. Any etiologic relationship of gastric ulcer to gastric carcinoma cannot be traced in these specimens.

Ulcerated gastric lesions which appeared benign grossly were proved by the microscope to be malignant in 18.7 per cent of the cases studied. It is impossible to state whether they represent an ulcerating carcinoma or an ulcer which has undergone malignant transformation.

C. A. BOWERS.

**Woolsley, G.: The Surgical Aspects of Gastric Hæmorrhage.** *N. Y. M. J.*, 1918, cvii, 395.

The cause of gastric hæmorrhage may be in the stomach or outside. Hæmorrhage from gastric ulcer is not so frequent as often supposed and hæmorrhage *per se* is of little value in the diagnosis of ulcer. The correct diagnosis of the cause of the hæmorrhage is made in less than half the cases.

The cases of gastric hæmorrhage curable by surgical operation are those due to chronic ulcer and carcinoma and to diseased conditions of the appendix, gall-bladder and spleen.

Operation should not be done during profuse hæmorrhage. Such cases should be treated medically and operation done when the patient has sufficiently recovered, if chronic ulcer is suspected. In cases of repeated hæmorrhages, operation should be done before the patient becomes profoundly anæmic.

Transfusion may be life-saving. It may check hæmorrhage alone, or make the patient an operable risk.

Gastro-enterostomy is the simplest and safest operation, but alone or even with pyloric exclusion is not an absolutely certain cure. Excision or resection should be added if the conditions are favorable. One should not be tempted to do too much.

If there is no ulcer, the appendix, gall-bladder and spleen should be explored with a view to removal if pathological.

C. A. BOWERS.

**Araya, R.: Dyspepsia Due to Perigastritis (Dyspepsias por perigastritis).** *Rev. méd. d. Rosario*, 1918, viii, 15.

The author gives the clinical history of 4 cases, in 3 of which he did a laparotomy with destruction of perigastric adhesions, and in the fourth case

accompanied by a gastro-enterostomy. Brilliant results were obtained in all cases. These were old cases diagnosed as dyspepsia gastralgia, malignant tumor, etc., which had been treated for years by various medical means with only temporary improvement or no results.

The author thinks that whenever clinical examination clearly establishes the existence of perigastric adhesions, or when the failure of medical treatment necessitates a laparotomy which reveals the existence of perigastritis, there should be a careful removal of all new-formed adhesions so as to restore normal motility of the stomach. This in most cases will definitely cure the stomach troubles. When the adhesions are thick and resistant and normal motility of the stomach cannot be assured, a gastro-enterostomy should be added.

W. A. BRENNAN.

**Field, M. T.: Gastroduodenal Perforation; a New Diagnostic Sign.** *Boston M. & S. J.*, 1918, clxxviii, 220.

The author discusses the diagnosis of gastro-duodenal perforation, citing several cases. He concludes that:

1. The diagnosis of perforation of the stomach and duodenum must many times remain in doubt unless aided by some distinctive and reliable sign, independent of parietal peritoneal irritation and tension.

2. In every case of perforation, gas and fluid are present in varying amounts in the free peritoneal cavity. The gas may pass between the liver and diaphragm, as shown by the X-ray and cause obliteration of liver dullness.

3. Much dependence cannot be placed on liver percussion as ordinarily practised because of the very great variations, both in health and disease.

4. Change of the patient's position will cause the fluid to flow to the dependent part and the air to rise to the top. This will intensify the findings: tympany over a wide liver area and again flatness over the same area on change of position.

5. Normally there is a change in the liver percussion note on change of posture. This was noted in a large number of normal cases examined, but in none of these were the results similar to those found in the cases reported. Normal liver changes must be recognized before positive deductions are made. A fair comparison is the difference detected in shifting dullness in the flank due to moderate ascites, and in the normal abdomen.

6. The author believes that this sign is of considerable value and should be sought for in every case. If absent in the presence of other positive signs of perforation, it may be disregarded, but if present in doubtful cases, it may be the deciding diagnostic factor.

H. H. FREILICH.

**Stewart, F. T.: A Method of Permanent Gastrostomy.** *Tr. Am. Surg. Ass.*, Cincinnati, 1918, June.

A rectangular flap of skin is raised from the epigastrium and sutured around a catheter. The

lower end of the dermal tube thus formed is sutured to the margins of an opening which is made in the anterior wall of the stomach. The lower half of the dermal tube is buried by inversion sutures in the gastric parietes, the upper extremity of the canal so made in the gastric wall being sutured to the parietal peritoneum. The rectus is sutured around the upper half of the dermal tube and the cutaneous incision closed. The method has all the advantages of providing a canal lined by epithelium, without the disadvantages inherent in the procedures which supply a canal lined with mucosa.

**Margarit, F.: Perforation of the Duodenum and Formation of a Large Intra-Abdominal Cyst** (Caso de perforacion del duodeno y formacion de un gran quiste intra-abdominal). *Gac. méd. catal.*, Barcelona, 1918, lii, 121.

The author relates the case of a man dying after severe hæmatemesis and enterorrhagia. At the autopsy a large cyst was found in the abdomen. The anterior and external part of the cyst was formed by the abdominal wall; posteriorly it was limited by the peritoneum covering the right kidney; superiorly by the lower face of the liver. Internally the cyst showed a partition starting from the anterior face of the stomach and large mesentery and terminating in the anterior abdominal wall. The transverse colon shared in enclosing the cyst, which contained from four to five liters of a dark sedimentary fluid. The stomach, having been opened in its anterior face, showed the same dark coloration of the cyst. The pylorus and neighboring parts were massed together by thick adhesions. In the first part of the posterior duodenum a perforation a few centimeters long was found which communicated with the cavity described.

It appears that the liver acted as a tampon in a prior ulcer of the lesser curvature of the stomach, and the ulcerous process continuing farther down, it terminated by the perforation which at length caused the patient's death.

The author discusses the pathological conditions giving rise to abdominal cysts from the perforation of gastric ulcers. Such an occurrence is very rare.

W. A. BRENNAN.

**Northrop, H. L.: A Pair of Artery Forceps in the Intestinal Tract for Four Years.** *Hahneman. Month.*, 1918, liii, 86.

A woman, aged thirty-six, presented herself complaining of pelvic discomfort. She gave a history of having had two operations performed in 1908 and 1913 for the removal of a pelvic tumor and for oöphorectomy. She was constipated and bowel movements were very painful; she had seen blood in her stools. By external examination a nodular movable tumor was felt in the lower abdomen to the right of the median line. Vaginal examination revealed the presence in the upper part of the rectum of a pointed, metallic object, presumably a pair of forceps. X-ray examination disclosed a pair of



artery forceps, the rings or handle being directed upward and the jaws being directed downward.

On opening the abdomen the two blades of the forceps were contained within the lumen of the sigmoid colon, while one ring was situated in the cavity of the cæcum and the other projected through the ileocæcal valve into the ileum. It was now evident that a short circuiting anastomosis had been performed between the cæcum and the sigmoid when she was previously operated upon, for there were the blades of the forceps projecting through the anastomotic opening. When the cæcum was opened anteriorly, the forceps were seen surrounded by a considerable quantity of hard, faecal matter.

The patient's recovery was rapid and complete.

EDWARD L. CORNELL.

**Twyman, E. D.: Non-Rotated Ileum with Fatal Intestinal Obstruction Due to Occlusion of the Ileum by the Over-Riding Colon.** *J. Am. M. Ass.*, 1918, lxx, 672.

The author reports a case of anomalous relation of terminal ileum, cæcum, and ascending colon.

The relations are described in detail, differing from normal in that the ileum in its lower 30 inches passed behind the posterior parietal peritoneum, and then from a point 2 inches below the hepatic angle of the colon passed down lateral to the colon, around the cæcum, and entered the ileocæcal valve in the usual way. A Meckel's diverticulum in the course of this lower ileum showed evidence of former inflammation. Fibrous bands crossing the ileum in its retroperitoneal portion caused intestinal obstruction.

The case report describes a chronic obstruction, an unrelieved acute attack of which led to operation.

The possible causes of the unusual relations and the acutely obstructed state are discussed, and the following classification of non-rotation cases is given:

1. Non-rotation complete, of both large and small bowels.
2. Non-rotation, partial or incomplete, of both bowels.
3. Over-rotation, with pelvic position of cæcum and appendix.
4. Mal-rotation, causing the colon to assume an abnormal relation to certain organs or membranes.
5. Non-rotation of a portion of the small intestine with the remainder normal.

The case reported necessitates the fifth group, being the first case reported of this character. The case supports the theory of the possibility of inflammatory adhesive processes in the peritoneum.

V. E. DUDMAN.

**Melchior, L.: Appendicitis and Foreign Bodies** (*Appendicitis e lorpore alieno*). *Nord. med. Ark.*, Stockholm, 1917, i, Kirurgi, No. 15.

The author investigates appendicitis where the infection is believed to be induced by injury to the

mucous membrane or the entire wall by a foreign body which has entered through the mouth. Apart from animal parasites and from faecal stones, and considering only dead substances entering by the mouth, surgical literature most frequently mentions needles, pins, fishbone, pieces of glass, buttons, fruit pits, etc., as the kind of foreign body found in the appendix.

As regards frequency, statistical reports of operations by various authors show that foreign bodies in the appendix are found in a proportion varying from 0 to 7 per cent. In 400 appendices examined in the author's pathological institute, foreign bodies of dead matter were found 8 times, or 2 per cent.

As regards the mode of entrance of foreign bodies into the appendix, the author mentions one point particularly, namely, dislocation of the appendix downward, particularly when it is contained in a hernia.

The author discusses the probability of appendicitis being caused by the presence of a foreign body, and is of the opinion that on the average a foreign body in the appendix is rather an uninjurious phenomenon.

W. A. BRENNAN.

**Desmarest: Rectal Palpation in Cancer of the Rectum** (*Du toucher rectal dans les cancers du rectum*). *Arch. d. mal. de l'appar. digest.*, Par., 1917, ix, 361.

Desmarest calls attention to the frequency of cancer of the rectum and of the large intestine, 50 cases of which he has seen within three years. Such cancers may remain unrecognized for a long time. Desmarest thinks that in order for such patients to be benefited by surgery, very early diagnosis is necessary; he finds this can be effected by rectal palpation, which unfortunately is very often neglected by practitioners.

Rectal cancers may be divided into two large classes: (1) that class of cancers entirely or almost entirely explorable by rectal palpation, of which this method permits a perfect investigation because it determines their situation, and the degree of invasion, points which are sufficient to enable the surgeon to decide the course to follow. Rectoscopy is here only an accessory procedure which may be used when needed in certain cases, such as the removal of a fragment of tumor. The cancers which come within this category are cancers of the anal canal and cancers of the lower half of the rectal ampulla. (2) That class of cancers hardly accessible by rectal palpation, for which it gives only very incomplete indications, and for the investigation of which rectoscopy must be relied on. Such are cancers of the upper part of the rectal ampulla and cancers of the rectosigmoid region.

Desmarest gives details of his method of rectal palpation. He prefers lateral decubitus, the lower limb being extended and the upper flexed. It is necessary to become thoroughly expert in distinguishing between the different sensations in order to differentiate between a tumor of the

prostate or seminal vesicle in man, or a uterine or adnexal complication in a woman. The mode of occurrence of a rectal cancer and its physical features give distinct characteristics and can be recognized by expert palpation. The rectoscope cannot be introduced in a lumen narrowed by a tumor without danger. Neither can it give the surgeon indications as to the height or extent of the lesions; a laparotomy alone can inform him in such cases.

The author thinks that rectal palpation is indispensable in the case of any patient who shows signs of enteritis or bleeding from the rectum. In a later paper the author will give the results of his surgical interventions in cases of rectal cancer.

W. A. BRENNAN.

**Barnes, R. H.: Should the Sphincter Muscles Be Divided?** *Interst. M. J.*, 1918, xxv, 46.

Since 1913 the author has not divided a sphincter muscle in the treatment of anal fistula and has become more enthusiastic over his success in obtaining drainage without dividing these muscles. If the sphincters are not involved, it is a simple matter to lay open the skin overlying the tract in order that drainage may be obtained.

When the sphincters are involved, the incision should be in the direction of the muscle fibers rather than in the direction of the spoke of a wheel to the anus. By the use of submucous dissection, drainage can be obtained from the inside of the sphincters. If necessary, the opening can be extended completely around the sphincter without dividing it.

An abscess located in the superior pelvesrectal space can be drained by following up the opening at the anus, without going through the ischiorectal space. The perineum is the most difficult region from which to obtain drainage without injury to the muscles, because the muscles center from so many directions. Packing these wounds for twenty-four hours will produce considerable separation and a better opening for drainage. By this method of not dividing the sphincter muscles there is less danger of incontinence and less deformity. E. B. FREILICH.

**LIVER, PANCREAS, AND SPLEEN**

**Mayo, W. J.: The Liver and Its Cirrhoses.** *J. Am. M. Ass.*, 1918, lxx, 1361.

The liver is the central metabolic laboratory of the human body responsible for the final preparation of nutritive material for conversion into tissue-building and energizing substances.

The portal system is made up of the gastro-mesenteric veins and the splenic vein, and it should be noted that the normal splenic vein carries to the liver from one-eighth to one-sixth of the total quantity of portal blood. The enlarged spleen has vessels in accordance with its size. The large spleens in certain splenomegalies may have vessels the size of the superior mesenteric artery and vein. This is

most important, as it indicates that removal of the spleen relieves the liver of a large load of blood and, as shown by the results of splenectomies, this diversion to the general circulation may be sufficient to relieve the subnormal liver of its overload and enable the patients to return to a fair degree of health in otherwise fatal cases. Splenectomy establishes a new principle of treatment, namely, a reduction instead of a diversion of portal circulation, as accomplished in the experimental Eck fistula and the Talma Morrison operation. The stomach and rectum have each a double vascular circulation, portal and systemic, and ligation of the portal vessels of these two organs may have a field.

The liver has five chief functions:

1. The glycogenetic function of the liver is most important in the final conversion and storage of carbohydrate derivatives in a form from which energy is most readily produced.

2. The amino-acids from protein digestion, of which 18 have been described, are carried to the liver by the portal vein and a considerable part of the nitrogen-containing portion of the molecule is converted into urea. The amino-acids are used to repair tissue waste as well as to supply energy.

3. The fat function of the liver is not well understood. It is known that sugar and fat are stored temporarily in the liver, ready for immediate use. It is probable, under certain circumstances, that carbohydrates are converted into fat in the liver. In acute stress such as occurs in phosphorus and chloroform poisoning, and massive infections, the liver may undergo a most rapidly fatal fatty degeneration. Its usual response to destructive insults appears to be acute fatty degeneration. In these first three functions, namely, the metabolism of carbohydrates, proteins and fats, the liver completes a process started in the gastro-intestinal tract. In the next two, the bile and defense functions, the spleen is associated with the gastro-intestinal tract.

4. The bile pigments are derived from destroyed red corpuscles carried to the liver, partly from the spleen. The latter view agrees with the known results of blood transfusion in the anæmias. When enormous quantities of blood are destroyed, as in hæmolytic icterus, the liver as well as the spleen becomes greatly enlarged, a condition that has been confused with biliary cirrhosis. The enlargement may be looked on as hypertrophy due to overwork with hyperplasia of the liver cells.

5. The defense function of the liver is very important. Bacteria are constantly being carried to the liver from the portal circulation. At times these bacteria pass through to the bile-ducts and gall-bladder, causing infections. The spleen strains out many bacteria, as in typhoid fever, and protozoa, especially the plasmodium of malaria and the spirochete of syphilis; but it is unable to destroy these organisms and they are sent to the liver for destruction. The interrelated pathologic condition of the spleen and liver follows closely this interrelation of function.



Cirrhosis is a term applied indefinitely and indiscriminately to almost any condition of the liver which is not understood, but in which there is an excess of connective tissue. The outstanding feature of all liver changes, the result of chronic irritation, without regard to cause, is the deposit of connective tissue. This is well shown in the local cirrhotic processes which may accompany cancer, syphilis, and tuberculosis of the liver. The two types of cirrhosis are:

1. Portal cirrhosis, in which the chronic irritants, probably biochemic substances, are introduced through the portal vein, and in which circulatory disturbances are the most prominent clinical features, causing gastric hæmorrhages, and especially ascites. Jaundice is seldom present and only as a terminal symptom.

2. Biliary cirrhosis, in which jaundice is clinically the chief symptom, ascites being absent or if present being a terminal condition, with the evidence pointing to an infectious cause. In portal cirrhosis the connective tissue is introduced about the radicles of the portal vein, and in biliary cirrhosis, about the bile-ducts. In both portal and biliary cirrhoses the spleen is often enlarged and has a causative relation in many cases such as the terminal portal cirrhosis of the splenic anæmias, the so-called Banti's disease.

The large majority of cases that have taken the term of Hanot's cirrhosis are either hæmolytic icterus or the ordinary type of biliary cirrhosis. As a matter of fact, hæmolytic icterus, primarily a splenic disease with hypertrophy of the liver, has been confused with biliary cirrhosis and, as gall-stones with recurring exacerbations of infections existed in 60 per cent of the cases in which the spleen was removed for the cure of hæmolytic icterus, this confusion has not been entirely without excuse. If it is constantly borne in mind that, without regard to the nature of the irritant, the response in the liver is connective-tissue formation, and that this may involve the whole liver with typical symptoms or that it may exist locally, with few or no symptoms, it may readily be seen where confusion has arisen. While typical portal cirrhosis, on one hand, and typical biliary cirrhosis on the other, are well defined, atypical forms exist from mixed causes, such as portal cirrhosis with secondary biliary cirrhosis from gall-stone infections.

Better understanding of the atrophic type of portal cirrhosis has led to an underestimation of the frequency with which the cirrhotic liver is increased in size and weight. In biliary cirrhosis the liver is usually enlarged and is undoubtedly the late stage of a more frequent infection of the liver ducts which in most instances recover or develop only localized areas of biliary cirrhosis without increase of the size of the liver or jaundice. Chronic hæmatogenous infections of the gall-bladder and ducts usually with gall-stones are the most common cause of these local mild cirrhotic processes. The pancreas is often involved in the chronic inflammatory process. Transient icterus may or may not be present.

In five cases of portal cirrhosis with ascites in which the enlarged spleen was removed, the four patients who recovered were greatly improved both as to their general condition and the relief of the ascites. The results in these cases should encourage splenectomy in suitable cases of portal cirrhosis in the future, especially when the spleen is enlarged.

Biliary cirrhosis of the obstructive or acutely infective type is easily understood. It exists in connection with gall-stones, particularly those in the common duct, and jaundice is an early and continuous feature. Many of these cases, however, are not cured by the removal of gall-stones and biliary drainage. In five cases of this type, in all of which the spleens were enlarged and the patients more than thirty-five years of age, splenectomy was performed.

The confusion which has arisen between biliary cirrhosis and hæmolytic icterus has somewhat of a parallel in the failure to differentiate those ascites due to multiple serositis (Concato's disease) and portal thrombosis from portal cirrhosis.

**Bevan, A. D.: A Case of Choledochoplasty and the Demonstration of an Overlooked Common Duct Stone.** *Surg. Clin. Chicago*, 1918, ii, 49.

Bevan reports a case of choledochoplasty in a patient who six months previously had been operated upon for stricture of the common duct. At the time of the first operation gall-stones were found in the gall-bladder, but none in the cystic or common ducts. She had had a rather typical history of repeated attacks of gall-stone colic, but never associated with jaundice or with any symptoms pointing to obstruction of the common duct. At the time of operation, because of the extensive disease of the gall-bladder, it was thought best to do a cholecystectomy. This was done with some difficulty on account of the adhesions and at the close of the operation, when the surgeon was ligating the cystic artery, a severe hæmorrhage occurred which was difficult to control. Finally it was controlled by crushing a considerable piece of tissue containing the vessel in a pair of forceps and ligating *en masse*.

In forty-eight hours the patient developed symptoms of common duct obstruction, as shown by the presence of jaundice. The surgeon, feeling that he had probably injured the common or hepatic duct with the ligature or clamp, opened the laparotomy wound, divided the ligature that had been used in controlling the hæmorrhage and removed it in the hope that the obstruction to the common duct would be removed. Within a few days bile poured out of the external wound and the woman went on to a fairly good recovery.

The biliary fistula persisted for months and finally an operation for restoring the continuity of the common duct was proposed. At this operation the ends of the divided duct were found and the cross-piece of a T-shaped tube introduced into the hepatic duct above and down into the common



duct below. The shank of the T-tube was brought out externally, so that the bile could run into the dressings. The jaundice was relieved at once. The tube was left in for months and finally removed, with the hope that a permanent canal had been established which could carry the bile into the duodenum. At the last operation the operator tried to introduce a tube through the common duct into the duodenum, but was unsuccessful as the tube would not pass through the constructed papilla. After removal of the tube the jaundice returned intermittently and finally became persistent, and the patient was referred to the author for treatment.

At his operation Bevan found the omentum adherent to the liver, stomach and duodenum. At the right free fold of the gastrohepatic omentum a little tube was exposed, which was the common duct. On dividing the common duct no bile was found and it was evident that the liver had ceased to secrete bile because of the great intrahepatic pressure produced by the stricture.

To restore the common duct he passed a No. 12 catheter from the common duct to the duodenum, carrying one end up into the hepatic duct for about half an inch and stitching it to the outer edge of the hepatic duct with two fine linen sutures. The other end was carried through the lower part of the common duct into the duodenum, so that five or six inches of the catheter remained in the duodenum. He then closed part of the incision of the common duct over the catheter. For a considerable distance this could not be done, so he covered the defect in the common duct with a piece of omentum.

The patient made a very satisfactory recovery and the jaundice rapidly disappeared. X-ray pictures taken at the end of four weeks showed the tube still in position.

In connection with this case Bevan reports one in which a common duct stone was found at autopsy but had been overlooked at operation.

The patient had been operated upon twice previously and when brought to Dr. Bevan was suffering from jaundice due to an obstruction of the common duct. At operation dense adhesions were found about the liver, stomach, duodenum, transverse colon and omentum. At the location of the common duct an abscess containing pus and small irregular flakes of material resembling cholesterol were found. The patient was in such bad condition that the abscess was simply drained. Three weeks later she died from cholæmia and the development of a duodenal fistula.

At postmortem an opening was found in the duodenum probably at the point where the second surgeon had made an anastomosis between the hepatic duct and duodenum. The common duct was patulous throughout. There was no stricture or carcinoma, but at the junction of the right and left hepatic ducts and blocking up the beginning of the common duct entirely was a small stone.

The moral which he draws from these two cases is: first, the importance of doing cholecystectomies

with very free wide incisions, so that the cystic duct and cystic artery can be completely exposed when they are ligated without carrying any risk of injury to the hepatic or common duct; and second, the importance of examining the common duct and hepatic duct for stones and removing them at the same sitting.

He says that reconstruction of the common duct for carcinoma has had a very narrow field and the operation is necessarily palliative and should be either a cholecystenterostomy where possible, or a cholecystostomy where there is difficulty and the condition of the patient does not warrant prolonged operation.

G. W. HOCHREIN.

**Benjamin, A. E.: An Accessory Pancreas with Intussusception.** *Ann. Surg.*, Phila., 1918, lxvii, 293.

Kemp states that an accessory pancreas is a mass of pancreatic tissue, entirely separate and having its own duct; it may assume the functions of the main organ when that is diseased and may cause diverticulæ and herniæ of the wall of the intestines. Opie reports ten cases in 1,800 autopsies, those lying above the pancreas in the duodenum and stomach, and those in the duodenum and jejunum. They have been found in the ileum, in an umbilical fistula, in the mesentery, and in fat of the great omentum.

The pathological changes affecting accessory pancreatic tissue are fat necrosis, and chronic interstitial inflammatory and malignant growth.

An accessory pancreas may sometimes be a causative factor in the production of diverticulum of the intestine by exerting continuous traction on the intestinal wall during development. If the swelling protrudes into the lumen of the bowel and attains a considerable size, it might produce obstruction, or it might cause an intussusception.

Warthin reported 49 cases in 1904. There are 17 cases reported of an accessory pancreas in the jejunum.

The author reports a case of an accessory pancreas with intussusception. This patient was aged thirty-nine. There was severe pain in the lower abdomen and for two months previous to operation it was localized in the right upper quadrant; this pain started in the right side and moved toward the umbilicus. For two months there was vomiting, at first every week and later every two or three days. Emesis had been from one to two quarts, containing no blood, and dark green and bitter. Stools were black for three months.

Exploratory operation revealed an intussusception of the upper part of the jejunum. This was reduced and found to contain a tumor-like mass involving the jejunum. Because of the condition of the patient resection was not done, but a lateral anastomosis was made around the growth. The patient died five days after the operation and autopsy showed the presence of an adenoma of an accessory pancreas.

C. A. BOWERS.



**Pacini, A. J. P.: Splenectomy in Splenomegalies.** *Ann. Surg.*, Phila., 1918, lxxvii, 299.

Splenectomy was first done in 1549 for malarial splenomegaly by an Italian surgeon, Zaccvello. Very little was done from this time until 1826. In 1908 Johnston reported upon 708 splenectomies.

Splenomegaly deals with an inherent increase in the volume of the spleen, exclusive of certain pathological entities, such as abscesses, parasitic cysts and impactions incident to acute infective processes, and those chronic intoxications and circulatory disturbances which occasion "amyloid" and "cardiac" spleen.

Splenomegaly deals with: (1) infantile splenomegalic anæmia; (2) the Griesinger type of splenic anæmia; this is a large spleen, with enlarged liver and lymph-nodes without leukæmia; (3) Banti's disease; (4) Vaquez's disease, characterized by splenomegalia, anæmia and cyanosis; (5) Gaucher's type of splenic anæmia; there is a discussion as to whether this is a true splenic tumor (endothelioma), or a generalized hæmatopathy with splenic localization; (6) chronic splenomegalic hæmolytic jaundice; (7) leukæmia and pseudo-leukæmia; (8) pernicious splenomegalic anæmia; (9) primary tuberculosis of the spleen; (10) splenic syphilis; (11) malarial spleen; (12) infection with Leishmann's spirillum.

Splenectomy is indicated in: (1) Banti's disease, particularly the first stages; (2) Griesinger disease; (3) chronic splenomegalic hæmolytic icterus; (4) primary splenic tuberculosis; (5) hereditary splenic syphilis after medication fails; (6) chronic malaria, attended with splenomegaly.

Splenectomy is of questionable value in: (1) splenic infantile anæmia; (2) pernicious splenomegalic anæmia; (3) Gaucher's disease.

Splenectomy is contra-indicated in: (1) splenomegaly incident to leukæmia and pseudo-leukæmia; (2) splenomegaly of kala-azar. C. A. BOWERS.

### MISCELLANEOUS

**Smith, F. H.: Acute Abdominal Pain in Children.** *Virg. M. Month.*, 1918, xlv, 533.

The author discusses acute abdominal pain as a symptom induced by slighter stimuli in children than in adults.

Acute appendicitis and intestinal obstruction are the great abdominal emergencies of childhood; their important diagnostic points are discussed.

Ureteral spasm incidental to infection of the upper urinary tract may confuse, in the absence of a routine investigation of the condition of the urine.

Abdominal pain in children should always cause suspicion to be directed toward possible pulmonary involvement. V. E. DUDMAN.

**De Forest, H. P.: Abdominal Injury Due to Blunt Force; Difficult Diagnosis.** *Am. J. Dis. Child.*, 1918, xv, 273.

The case was that of a girl, four years old, who fell over backward while on a hobby horse, the saddle striking her directly across the abdomen at the umbilical level. The only immediate effect was slight pain and tenderness over the right lower ribs. On the afternoon of the second day following the accident, the temperature rose to 103.5°. Examination at that time excluded injury to the intestines, liver, gall-bladder, or kidney. The tentative diagnosis was either injury of an abnormally placed appendix or a hæmatoma of the abdominal wall.

The next day the acute symptoms had subsided. One week later a mass was found lying below the free border of the ribs on the right side. This mass was very tender and painful and was thought to be the liver, either abscessed or containing a new-growth, or an encapsulated hæmatoma. The mass rapidly increased in size, and there was cardiac and respiratory oppression with progressive anæmia.

On the thirty-sixth day following the accident an exploratory laparotomy was done. The liver was found to be normal but entirely displaced by a large mass, which when opened was found to contain serum, blood and clots, and a few soft pale-gray masses resembling sarcomatous tissue of the small round-celled type. This mass proved to be the right kidney entirely disorganized and broken down, the tumor wall being the kidney capsule. The kidney was drained and packed.

Autopsy examination showed a slight loss of cortical substance from the kidney and a contusion of the kidney capsule, allowing a slow but progressive hæmorrhage to take place beneath and within the capsule. I. W. BACH.

## SURGERY OF THE EXTREMITIES

### DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS, CONDITIONS COMMONLY FOUND IN THE EXTREMITIES

**Berg, A. A., and Thalhimer, W.: Regeneration of Bone.** *Ann. Surg.*, Phila., 1918, lxxvii, 331.

A series of experiments was performed on cats. Autogenous grafts from the tibia were transplanted on the costal cartilage after the perichondrium had

been removed; a few were transplanted into the substance of the spleen, and a few subcutaneously. All transplants showed new bone formation. These transplants were then studied microscopically.

The following conclusions were arrived at:

Periosteum, devoid of adherent bone-cells, when transplanted into foreign tissues produces bone. Endosteum and osteoblasts lining haversian canals and the cambium layer, when adherent to trans-

planted cortex, all produce bone. Some of the newly formed bone-cells live for nearly a year but most of the bone is absorbed. Fully developed bone-cells, though they may remain alive for a long time, do not reproduce themselves to form new bone. Very young lacunar cells can reproduce themselves and form bone. Transplanted bone is absorbed not only by osteoclasts, but also by the direct action of growing young bone, and the transplanted bone is replaced by the extension and growth of new bone into the transplant. Marrow spaces and hæmatopoietic marrow are formed in the bone which develops from transplanted periosteum. The source of the hæmatopoietic cells was not determined.

LISTER TUHOLSKE.

**Dodd, V. A.: Periosteal Sarcoma of the Clavicle.**  
*Ohio St. M. J.*, 1918, xiv, 141.

The largest and most important group of sarcomata originate in the osseous system. From a collection of 797 cases of osseous sarcoma it was found to occur most frequently in the jaw and least frequently in the clavicle.

Because of the similarity of early sarcoma to mild inflammatory disease, and its rapid spread through the blood stream, its early diagnosis is imperative.

A definite history of trauma is frequently obtained but its relation to the growth is sometimes questionable. Pain or swelling first brings the patient to the physician. Examination at this time reveals a fusiform, immovable, hard enlargement near the epiphysis. The mass is not very tender to pressure, but the patient complains of deep-seated, dull, boring pain. In the slower growing type the periosteum may give rise to a thin layer of bone which imparts an egg-shell crackling and reveals the condition on X-ray examination. In all types the X-ray is a valuable aid. Whether or not surgical measures can be employed, Coley's toxins should be used. As in the series of 797 cases, only 3 occurred in the clavicle. The author reports a case.

I. E. BISHKOW.

**Barrie, G.: Fibrocystic and Cystic Lesions in Bone.**  
*Ann. Surg.*, Phila., 1918, lxvii, 354.

Fibrocystic and cystic lesions in bone, which are non-neoplastic, are divided into two groups. Group 1 includes all multiple lesions in a single bone, single lesions in numerous bones, and multiple lesions in several bones. These lesions are all due to some general systemic disturbance. The main etiological factors are (a) metabolic processes, (b) syphilis, (c) tuberculosis, (d) other bacterial infections, (e) parasites, (f) hæmophilia.

Metabolic processes are due to interference with the function of endocrine glands. In this sub-class are included osteitis fibrosa cystica and osteitis deformans.

The congenital more often than the acquired form of syphilis frequently shows localized cystic or fibrocystic areas in the cancellous bone.

Group 2 includes solitary cystic and fibrocystic bone lesions arising independently of those associated with neoplasms. Seventy-five per cent are due to bone trauma following direct injury, dating back months or years. They are usually painless. In cases of pathological fracture, X-ray of the entire skeleton often reveals fibrocystic lesions in other bones, as well as at the site of fracture.

A series of X-ray plates extending over a period of several months is of the greatest value in diagnosis differentiating between different members of Group 2.

Treatment of the solitary lesion consists of thorough curetting and swabbing with tincture of iodine for stimulative regenerative effect. All cavities larger than a pigeon's egg are filled with shavings taken from adjacent bone, to shorten the process of repair and cure.

V. E. DUDMAN.

**Platou, E.: Osseous Cysts and So-Called Giant-Cell Sarcoma.** *Ann. Surg.*, Phila., 1918, lxvii, 312.

Osteitis fibrosa with giant-cell tumor is a benign disease and as such should be distinguished from giant-cell sarcoma. Osteitis fibrosa occurs chiefly in the young adult; trauma is the usual etiologic factor. A slow inflammatory process of the bone ensues. Slowly the bone swells, causing rheumatic pains; fibrosis of the medullary tissue follows with rarefying osteitis and cyst formation. The walls of the cyst are usually smooth and seldom penetrate the periosteum. The bony wall may be so thin as to crackle on palpation. The roentgenogram is of great help frequently. A sarcoma usually shows periosteal changes.

The treatment is exclusively surgical, but conservative. When there is a cyst, with serum-like contents, remove the serum, scrape the walls, and push in the shell. Preserve the periosteum as this will form callus to fill up the cavity. During the scraping, profuse bleeding may occur, so an Es-march band is to be used. If the cyst is so large that removal causes the bone to break, bone grafting or ivory stick may be resorted to. Microscopic examination of the excised tissue does not always determine the diagnosis.

LISTER TUHOLSKE.

**DeMata, R.: Interscapular Thoracic Amputation**  
(Amputation interescapulotorácica). *Rev. clin. de los hosp.*, Madrid, 1918, iii, 129.

The indications for interscapular thoracic amputation are usually sarcomatous tumors on the upper humeral extremity or involving the scapula and soft peri-articular tissues. Kawamura's statistics of 315 cases compiled in 1910 showed that sarcoma was the cause in about 60 per cent of the cases. Operation may be called for in severe traumatism, extensive burns, etc. The mortality is relatively slight, not exceeding 3 per cent.

The author reports 4 cases, carried out according to classic technique, one a personal case, and the other 3 communicated by Vigueras. The author's case was in a man about thirty years old, and



Viguera's cases were in females aged twenty-one, twenty-six and sixteen years respectively. All showed regional sarcoma. The four cases recovered, but there has been recurrence in one.

W. A. BRENNAN.

**Cotton, A., and McCleary, S.: Roentgenograms of a Case of Myxoma of the Femur.** *Am. J. Roentgenol.*, 1918, v, 195.

The text accompanying a number of roentgenograms describes the lesion as follows:

The whole shaft of the femur from neck to condyles was involved in the pathological process. There was enlargement of the bone with rarefaction and thinning of the outer compact bone. The rarefaction was not uniform; some areas were more marked than others. The contour of the bone was irregular on all surfaces. At the middle of the bone an area about three inches long and involving one-third of the circumference was shown where bone had been removed by operation. Along the shaft of the bone, especially at the site of a previous operation, were numerous small projections of new bone extending outward from the periosteum in different directions.

The operative findings are also given, together with the pathologist's report. ADOLPH HARTUNG.

**Tenani, O.: Causalgia and Its Surgical Treatment** (La causalgia et il suo trattamento chirurgico). *Polichin.*, Roma, 1918, xxv, sez. prat., 125.

Tenani reports two cases of causalgia occurring in the lower limb following war wounds, which he treated by perivascular sympathectomy as recommended and practiced by Leriche in war surgery since 1916.

The pathogenesis of causalgia appears to be rather complex; it may be provoked by isolated or variously combined lesions of either the nerve-trunk or of the perivascular sheath or of the vessel itself. Leriche assumed that the origin of causalgia was in the sympathetic contained in the peri-arterial sheath, and that consequently denudation of the sheath and freeing of the artery would cause the disappearance of causalgia. This he found to occur in several cases which he operated upon late in 1916 and early in 1917.

Tenani has obtained a similar result in the 2 cases operated upon by him. But sympathectomy as practiced by Tenani differs from the technique followed by Leriche in his operations. Leriche strips the artery alone, whereas Tenani also strips the vein. The reasons for this are both technical and clinical; clinical because it permits the whole of the vascular sheath to be removed with more certainty. The removal of the perivenous sheath by producing dilatation of the vessel and diminishing the endovenous pressure facilitates and increases the effect of the modifications in the circulation provoked by the resection of the peri-arterial sympathetic.

According to Tenani perivascular sympathectomy is the method of choice in causalgia. The number

of cases and clinical results are still too few, however, to express any dogmatic opinions concerning it.

W. A. BRENNAN.

## FRACTURES AND DISLOCATIONS

**Mitchell, H. C.: Fractures of the Pelvis and Resulting Injuries to the Urethra and Bladder.** *Illinois M. J.*, 1918, xxxiii, 107.

Sixty per cent of pelvic fractures are complicated by injury to the urethra or bladder or both.

Symptoms of pelvic fracture may show no deformity; there will be shock, manifested by pallor, an anxious expression of countenance, feeble pulse, cold clammy skin, weak voice, and insecurity on the injured side when attempting to stand, usually with some outward rotation of the limb. Deformity may be obscured by extravasation of urine in the tissues.

An X-ray should be taken, as sometimes the injury is mistaken for a dislocated hip, and in manipulating the bowel, the bladder or urethra may be wounded. If there is no deformity, no attempt should be made to reduce the bones. If urine is extravasated into the scrotum, perineum or over the abdomen, this should be immediately relieved.

Rectal examination should always be done. The patient should be moved carefully and placed on his back on a firm mattress or fracture bed; if more comfortable on the side, he should be allowed to assume that position. The legs should be drawn up and supported on pillows. The patient should be kept on his back for four weeks and in bed for six weeks. The bowels are evacuated on a rubber sheet and not elevated to a bed pan.

In ruptured urethra it is often necessary to do a retrograde catheterization in order to find the end of the urethra nearest the bladder.

It is important to make a suprapubic incision, because it enables one to find the torn ends of the urethra; it tells exactly where to make the perineal incision with the least invading of tissues; it shows whether the bladder is torn or injured, and if any urine is extravasated; any rupture of the bladder is visible; the ends of bones may be better replaced.

C. A. BOWERS.

**Serra, A.: Critical Review of the Treatment of Gunshot Fractures of the Long Bones** (Riassunto critico su la cura delle fratture delle ossa lunghe da proiettili di guerra). *Chir. d. organ. d. mov.*, Bologna, 1917, i, 493.

Serra writes from the Rizzoli Orthopedic Institute of Bologna. He thinks that the open fractures of war differ very much from those of peace. Formerly he considered that orthopedic methods could not be adapted to war wounds, but he has changed his opinion.

The factors rendering war fractures different from the common fractures of peace are: (1) multiplicity of wounds; (2) the type of injury caused by gunshot; (3) secondary and late hæmorrhage; (4) shock; and (5) infection.

In the general consideration of the repair in fractures the author verifies a fact which was well known to older surgeons, that the periosteum of the different long bones have not an equal regenerative power; if extensive portions of the humerus are easily and rapidly replaced after a subperiosteal resection, smaller losses in the ulna and tibia even in closed fractures cause rebellious pseudarthroses.

The author dwells on the difficulty of obtaining immobilization in the field service formations. He shows the disadvantages and advantages of the fixed plaster fenestrated apparatus, and discusses various types of splints, the use of which is fully described and illustrated.

Serra thinks that neither plaster immobilization nor traction of a particular or general type are sufficient to cure war fractures. Each case calls for individual treatment according to the wound, the region, the place and time of treatment.

The author discusses the details of treatment in the field and rear hospitals. He strongly advocates immobilization and extension, using splints of the Thomas type and fixing the bone fragments.

Clinical histories of more than 40 cases, a few treated by plaster apparatus, the majority by continuous traction, are given and illustrated. These fractures were mostly produced by bullets and therefore were not of the most severe type with suppuration and soft part lesions; but the skeletal injuries were however very severe. They were generally unaccompanied by associated lesions, wounds of the vessels, nerves, etc. Many of the cases had come to the Institute well immobilized with accurate approximation of the fractured fragments, and to such excellent early treatment the later very satisfactory results of the orthopedic treatment are partly due.

Only two functional and anatomically bad effects have been obtained, and in both cases were due to infection.

W. A. BRENNAN.

**Sneyd, G. C.: Remarks on the Treatment of Fracture of the Lower Limb.** *Lancet*, Lond., 1918, cxciv, 524.

Many of the fractures that have come under the observation of the author have been old on arrival and exhibited grave deformity due to one or more of the following conditions: (1) complete displacement; (2) compound fracture with sepsis; (3) extensive comminution; (4) loss of bone; (5) presence of a foreign body; (6) faulty splinting, mainly insufficient extension.

The treatment resolved itself into dealing with sepsis and correction of deformity.

Sepsis is chiefly caused by inadequate drainage or lack of extension, or else by the presence of a foreign body or sequestra in many cases. Various antiseptics have been used in combating sepsis but mechanics and judicious operative intervention with the production of drainage and extension are more important than chemistry in these cases.

Extension alone helps drainage by preventing pocketing of pus and allowing freer circulation; however, vigorous extension may lead to secondary hæmorrhage. Too free removal of comminuted bone is not advisable, as it may lead to considerable shortening.

The treatment in an early stage should be that of keeping the sinus or wounds clean while the limb is splinted in the most suitable position with extension, leaving free access for dressings to be applied.

Although many new forms of treatment have been introduced, fomentations remain one of the most useful remedies against sepsis. In sepsis good results follow a very minute dose of autogenous vaccine. The author has seen great benefit from the use of sulphur and glycerine. They are mixed until a creamy consistency is formed, and the wound filled with this cream; a fomentation of three or four layers is then applied around the wound, above and below it, surrounded by protective tissue and wool. This is not touched for forty-eight hours. "Bipp" is of great value and appears to lessen reaction after operation.

An X-ray in two planes should be taken before, during, and after treatment. When sepsis is well established it may be unwise to interfere with deformity. If the case is a recent one, sepsis would be greatly diminished by extension.

A great many recent cases can be set in accurate position by splints or plaster of Paris. A great deal depends upon the site of the fracture, its nature, and whether one bone only is broken, as in the leg. The condition as shown by the X-ray calls for more than the mere setting of the fracture; it demands as accurate a reposition as is possible, and the maintenance of the reposition.

It is often impossible to replace the fractured ends in cases one month or more old, muscles having contracted to such an extent that traction is of no value.

The more bone plating one sees, the more is one impressed by the futility of trying to reduce deformity by traction in cases of any duration. Callus is only noticeable by its absence in a large number of these cases of complete displacement, even after the period of one or two months. Bone plating in these cases insures the most accurate apposition of the fragments. Trauma during the operation is conducive to sepsis. Where a plating operation has been done, it is usual to allow the cases up in a Hoefftcke's ambulatory splint within one month after operation, the slight amount of strain involved stimulating callus deposition. In transverse fracture of the tibia alone, open manipulation is sufficient without plating, and in these cases traction is futile.

The author has frequently used the Thomas splint, but has always applied weight extension. He has also used the Hoefftcke war splint for fracture of the lower limb. This splint is of great service; it is telescopic and the upper flanges for counterextension



are adjustable, so that any case can be fitted accurately and comfortably without any pressure on the pubic bone or perineum. When union has progressed, the splint should be taken off and the knee- and ankle-joints moved occasionally to insure good joint function. Lateral deformity can be greatly improved even in quite old cases by applying lateral tension with rubber tubing.

V. C. HUNT.

**Gray, O.: Fracture of the Humerus Complicated with Musculospiral Paralysis.** *J. Arkansas M. Soc.*, 1918, xiv, 220.

The author reports two cases of fracture of the humerus where there was a complication by reason of injury to the musculospiral nerve.

He desires to call attention to the necessity of making a thorough examination of the mobility of the fingers before the fracture is reduced and the patient anesthetized. If this complication is found, a satisfactory explanation can always be made.

E. C. ROBITSHEK.

**Mayet, H.: The Treatment of Elbow Fractures in the Child** (Contribution à la thérapeutique des fractures du coude chez l'enfant). *Paris chirurg.*, 1917, ix, 595.

After having adopted the habitual method of reduction and immobilization in flexion of elbow fractures in young patients, Mayet has been struck by the real difficulties which he met in order to restore the integrity of functioning of the elbow-joint after the removal of the immobilizing apparatus. He therefore commenced his treatment by trying reduction in extension. It seemed to him infinitely superior.

At the end of ten days the elbow is placed in flexion. This second procedure is perfectly easily accomplished. After a second period of immobilization in flexion, the limb being again set free, Mayet has been surprised to observe that articular functioning was constantly effected with extreme ease and that total recovery of movement was very rapidly obtained. The method is simple; it is easily applied. Reduction in extension is particularly easy when the amount of displacement is not great, when assisted by radiographic control.

He has operated in 35 cases. Eighteen of these were supracondylar transverse fractures; 8 were fractures of the internal condyle with greater or lesser participation of the trochlea; 7 were epitrochlear fractures; two were fractures of the upper part of the radius. In the 18 transversal fractures all have recovered the normal movement of the elbow; in 5 for some months extreme flexion was impossible. Two of these later seemed to have recovered full flexion. The 8 condylar fractures gave satisfactory results within a month after the withdrawal of apparatus. The epitrochlear and radius fractures have given completely satisfactory results.

Mayet considers that his results are much superior to those obtained from the method of plaster cast in flexion.

W. A. BRENNAN.

**Doyle, E. C.: The Treatment of Fractures of the Elbow-Joint.** *J. So. Car. M. Ass.*, 1918, xiv, 67.

If the skin is broken the author uses 3 per cent iodine for cleansing, instead of soap and water. Iodine should not be used after the water, as the latter causes the cells to become oedematous and the iodine does not penetrate.

If there is nerve injury, these are united by bringing axis cylinder to axis cylinder, sheath to sheath, etc. If the olecranon is stripped of tissue, it is imperative that it be covered with normal skin with its underlying connective tissue, otherwise there will be trouble in flexing the joint.

If there is much swelling, one should wait until this subsides before tampering with the joint. This may be aided by bandages or by using evaporating lotions. Pain about the elbow may be due to an inflamed bursa and not to the joint itself.

The author follows the method of Jones, of Liverpool, in putting fractures up in acute flexion, instead of at 90 degrees. He then uses massage and passive motion later.

C. A. BOWERS.

## SURGERY OF THE BONES, JOINTS, ETC.

**Taylor, J., and McLeod, A. G.: The Operative Correction of Deformity in Gunshot Fractures.** *Lancet*, Lond., 1918, cxiv, 405.

Two classes of fractures are treated at Cambridge Hospital, Aldershot: first, simple fractures among men under military training; second, gunshot fractures from forces overseas. The simple fractures are first put in extension and if good alignment is not obtained in two weeks, an open operation is done. The two types of fractures usually requiring open operation are spiral fractures and fractures near a joint. If operation is delayed even a month, too much callus forms and the unapposed ends become rounded off; but, most important of all, the bones have become rarefied, and if one end of the fracture is short, the screws do not hold well enough to assure a good result even with plating. In all open operations the Lane technique is carefully followed. Neither the gloved hands nor anything which has touched them is placed in the wound. Everything is done with instruments.

In gunshot fractures the question of lighting up a latent infection has to be considered. As soon as such come under observation, the increase of the nutrition of the limb is first considered. Massage, hot air baths, and electrical treatment is started and in this way scars are relieved, induration and oedema cleared up, and the mobility of joints improved. If there is any latent infection it will be lighted up by this treatment, and with this as a guide the time for operation can be safely determined. The massage, etc., should be begun lightly and increased in severity and if there is local reaction of swelling, tenderness, and increased local heat, the wound is too active for operative procedure. If no reaction occurs after prolonged passive and then active exercise, operation may be safely performed.

The results obtained are: (1) no shortening in simple fractures and only the degree of shortening in gunshot fractures which is caused by actual loss of bone and necrosis from sepsis; (2) better range in joints than in non-operative cases; (3) much less pain and œdema because of minimum deformity.

P. W. SWEET.

**Derache, P.: Primary Osteosynthesis in War Surgery** (Note sur l'ostéosynthèse en chirurgie de guerre). *Bull. et mém. Soc. de chir. de Par.*, 1918, xlv, 465.

There are certain fractures for which continuous extension does not suffice because they cannot be reduced with coaptation of the bone extremities. It so happens frequently in leg fractures, particularly thigh fractures. Splintered fractures are also liable to pseudarthrosis, as well as difficulty of coaptation. For all these osteosyntheses renders great service.

The author has treated by osteosynthesis 4 fractures of the humerus; 4 of the forearm; 5 thigh fractures; 4 of the leg, and 1 patellar fracture.

For the osteosynthesis he used either metallic sutures or Lambotte's or Lane's plates. The Lambotte plate is preferred for the upper limb and the Lane plate for the lower. The plate method he thinks is infinitely better than metallic suture which never gives a complete immobilization of the fragments and there is always some displacement later. For after-treatment he always uses a Thomas splint and the limb is mobilized from the day of operation.

Case reports and illustrative radiographs are given.

The patients reached the hospital in from three to four hours after injury. In 8 cases the osteosynthesis was done on arrival. In 9 it was done in from three to fifteen days after injury and sterilization of the wound, and in one case somewhat later than fifteen days. In 10 cases the soft parts were primarily sutured, in 1 case secondarily, and in 7 not sutured.

In the majority the progress was apyretic. All functional results were excellent. W. A. BRENNAN.

**Churchman, J. W.: The Treatment of Acute Infections of the Joint by Lavage and Direct Medication.** *J. Am. M. Ass.*, 1918, lxx, 1047.

Preliminary cleansing of the lining membrane of a joint must be effectively accomplished before antiseptics can be expected to reach and penetrate the cells of the lining.

An apparatus is described as a device by means of which a joint may be mechanically cleansed and diffusible antiseptics may be applied in direct contact with the cells of the synovial membrane. This is done under local anesthesia.

Dilute solutions of gentian violet, applied either directly to the bodies of certain organisms, or to the medium on which they are grown, has been shown to possess a selective bactericidal action. Gram-positive organisms will not grow in the presence of the dye; Gram-negative organisms are unaffected.

This property was considered in the treatment of a series of eight infections of the knee.

The apparatus is fully described with illustrative cuts, and consists of a series of interconnecting chambers, all leading to a single tube, which is attached to an aspirating needle for insertion into the joint. The system is entirely closed so that rigid asepsis may be maintained. It is essential that the aspirating tube be as large as one-half a centimeter in diameter, that bits of mucus and fibrin may pass through.

The skin is anesthetized and the trocar inserted into the joint. The infective fluid is first withdrawn, and preserved for study.

Next, novocaine is forced into the joint cavity to the point of distention. This is withdrawn, and salt solution forced in. This is used for irrigation, until it returns clear. Peroxide is then forced in, and following this salt solution is used for washing until it returns clear. The joint is now filled to distention with gentian violet 1:1,000, and left for five minutes. This is then withdrawn and a small amount of a 1:10,000 solution introduced and allowed to remain.

Of the eight cases, two were pyogenic, five gonorrheal, and one of unknown etiology.

From a study of the results of treatment of these cases, conclusions can be drawn that apyogenic or gonorrheal infections of the synovial membrane of the knee can be cured by this method.

It is possible that this treatment may be applied to the pleural cavity, and to the kidney pelvis.

Experiments with pyorrhœa alveolaris have given cause for belief that a direct injection of gentian violet into tissues may prove effective.

V. E. DUDMAN.

**Barnsby, H.: Unilateral Arthrotomy with Total Primary Suture in Wounds of the Knee-Joint** (Arthrotomie unilatérale avec suture primitive totale dans les plaies articulaires du genou). *Bull. et mém. Soc. de chir. de Par.*, 1918, xlv, 388.

In January, 1917, Barnsby reported a series of knee-joint wounds treated successfully by arthrotomy followed by immediate total closure. Since then, he has modified his method by substituting unilateral arthrotomy in wounds with important epiphyseal lesions. He now reports 20 such cases with details.

There are three contra-indications to unilateral arthrotomy: (a) in important lesions of the tibial articular surface; (b) in total comminutive fractures of the patella; (c) in fractures in which an included projectile cannot be extracted by the lateral opening. In these three cases the larger arthrotomy is indicated in order to see clearly and act quickly. In all other cases, especially in a smashed condyle or half of the patella, the unilateral procedure suffices and is infinitely less mutilating and less damaging to the joint.

While early operation is best, good work can be done within the first twenty-four hours. While the position of the orifice is a guide, the radioscopy



examination showing the position of the projectile indicates the site of the lateral incision. The incision should be at least 1 cm. behind the edge of the patella, and about 4 to 5 cm. long to allow exploration and removal of foreign bodies, etc. If an important condylar lesion is found, the incision can be enlarged and sufficient light obtained by using retractors. The knee should be put in flexion. If there is a bicondylar lesion, the U-arthrotomy with tendon section is probably best. An extensive loss of substance can be filled with pieces of cartilage, but this might very well be omitted. A good provisory hæmostasis by compressing for five to ten minutes will suffice and Barnsby has never observed any complication such as a hæmarthrosis, necessitating punctures. The primary suture, after ether bath, is made preferably in three planes without drainage.

Although he previously upheld immobilization for 21 days, Barnsby has now joined the majority of surgeons who commence mobilization as soon as the sutures are drawn. Flexion at a right angle has been obtained by the twentieth day in nine-tenths of the cases. The men treated by unilateral arthrotomy without section of the patellar tendon mobilize their joints much more easily and complete recovery is more quickly obtained.

W. A. BRENNAN.

#### ORTHOPEDICS IN GENERAL

**Hazen, H. H.: Syphilis of the Joints.** *Virg. M. Month.*, 1918, xliv, 537.

About twenty per cent of all syphilitics have some joint involvement. The pathology is due to the treponema pallidum.

The diagnosis is made by looking for other signs of syphilis. Treatment consists of intensive mercury and salvarsan administration.

Types recognized in both acquired and congenital forms are: arthralgia, with intense pain but no demonstrable pathology; synovitis, with red, swollen joints and intense pain; hydro-arthritis, with a sudden effusion into the joint, but no fever or tenderness; osteochondro-arthropathies, due to gummata, usually appearing in the ends of the bone; Charcot joints, usually ascribed to trophic disturbances, but which the author believes are amenable to syphilitic therapeutics, since he has found evidence of bone syphilis.

JOHN MITCHELL.

**Ashley, D. D.: Shoes, Physiological and Therapeutic.** *N. Y. M. J.*, 1918, cvii, 433, 498.

The author considers shoes from a physiological and therapeutic standpoint. The physiological shoe should conform to the normal foot when in action. The therapeutic shoe is intended to correct or relieve the affliction of the feet and should conserve all the points of the physiological shoe.

The anterior foot is often deformed. Metatarsalgia, sensitive anterior arch, callosities, inflamed sesamoid bones of the great toe; all occur by the

forward thrust of the foot in an ill-adapted shoe. Such a foot requires a physiological shoe, one with added toe room, a heel lower than usual, a metatarsal elevation. Often the heel becomes sensitive in low-heeled shoes. The sensitive heel requires a shoe so fitted as to hold the heel cushion under the calcaneus.

Another distressing condition is the painful flattened heel. This condition is relieved by a heel one or two inches high, with a thick piece of felt under the tender area.

Deformities such as ingrowing toe-nails, clubbed toes, over-riding toes, hallux rigidus are the result of the pressure of wedged-toed shoes, and to the pressure of short shoes. Mild deformities are corrected by plenty of toe room in the shoe. Attention must be given to exercise of the intrinsic muscles. Bunions, hallux valgus and inflamed great toe-joints are treated by making the shoe snug posterior to the ball, with a straight inner vamp. The sole may be elevated one-eighth to one-fourth of an inch on the inner side to relieve pressure on the great toe-joint.

To relieve bunions and corns on the little toe, and the extremities of the fifth metatarsal, a re-balancing of the shoe is necessary.

Painful weak feet with no deformity are due to muscular weakness and loss of tone. These feet require physiological or therapeutic shoes, and exercises to strengthen the entire muscular and nervous system.

Pronated feet require control of the calcaneus, a snug counter to grasp the heel, or a physiological heel seat with a moderately broad heel, to aid in preventing deformity. The heel may be flared or extended on the inside.

The painful rigid foot is closely related and associated frequently with arthritic conditions. The author believes that this deformity has been frequently mistreated. The surgeon uses a brace, the physician medicates. Too little attention is given to the etiological factor present. When of recent origin, it is corrected easily by manipulation and strapping. When of long standing, the rigid foot offers great difficulty to treatment even under anaesthesia.

JOHN MITCHELL.

**Wade, R. B.: Re-Establishment of the Crippled.** *Med. J. Austral.*, 1917, ii, 452.

Happily a large proportion of the men will be able to overcome their disability by the use of suitably directed treatment. In most cases the cause of the extreme disabilities may be laid to sepsis. During a long period of healing, muscles waste and joints stiffen to an extraordinary degree, and deformities arise that are quite unavoidable. There is a condition of atrophy and complete loss of power due only to disuse which simulates a true paralysis. Prolonged immobilization in splints is a frequent cause. The various deformities may be due to the shortening of some of the muscles, with overstretching of the opposing muscles.

Massage and proper apparatus may relieve the condition to a marked degree. In performing nerve suture the muscles must be held relaxed until union has taken place, as a stretched muscle will never regain its tone. In joints where ankylosis is anticipated, the limb should be held in the most useful position for ankylosis. The elbow should be fixed at 90 degrees where the occupation is to be clerical, and 110 degrees where the labor is to

be manual. The shoulder should be ankylosed at 60 degrees.

As to operative measures to correct deformity, the chance of a latent infection should be borne in mind, and operation not attempted too early. The after-care consists of judicious massage, the whirlpool bath, and vocational training. These measures must be kept up vigorously and continuously; the results are usually excellent. J. J. KURLANDER.

## SURGERY OF THE SPINAL COLUMN AND CORD

**Derache, Gosset, and Bonome: Wounds of the Spinal Cord** (Blessures de la moelle épinière). *Arch. de méd. et pharm. mil.*, Par., 1917, lxxviii, 453.

Reports on war injuries of the spinal cord were submitted by the authors to the second Interallied Surgical Congress in May, 1917. Gosset had observed 200 such during twenty months and could operate in only 45 cases. These interventions were late laminectomies when there was not complete section of the cord. There was only 1 death. The most important points in order to secure benignity of the operation are: (1) hermetic closure of the dural sac when it has been opened; (2) very careful reconstitution of the muscular planes by a regular myoplasty; (3) omission of all drainage.

Bonome who has seen 300 cases finds that in the majority of cases the projectile reaches the cord in the posterior and lateral region of the spine. Penetration through the abdominal or thoracic route is not frequent.

In operating in order to lessen the gravity of the operation, Bonome limits the opening of the spinal cavity to lateral laminectomy. This allows easy exploration of the cavity and its contents and even of the side opposite the laminectomy. The operative results have always been satisfactory. With this method an immobilizing vertebral apparatus is unnecessary. Lateral laminectomy is very applicable in war wounds of the spine.

According to Bowlby, the indications for surgical operation are:

1. Displaced osseous fragments compressing the spine or irritating the nerve roots.
2. A projectile in the interior of the vertebral canal compressing the cord or lodged in one of the bundles.
3. Symptoms due to pressure caused by hæmorrhage between the meninges and the bony canal.
4. The relief of intolerable suffering.
5. Operation may be indicated at a late period although an early intervention may not be desirable.
6. Injury of the nerves of the cauda equina.

The Congress concluded that from the therapeutic point of view it is necessary to distinguish two distinct classes of spinal cord lesions: (a) those in which there is a complete section of the cord, in

which case surgery is powerless; (b) those in which there is compression due to a projectile, a bone chip, by osseous displacement, or a meningeal hæmorrhage.

In the majority of cases a primary operation must be avoided. In the Italian army, in the case of osseous compression or a projectile embedded in the canal, they have adopted the principle of operating as early as possible in order to remove the projectile, particles of clothing, etc., and free the cords and veins. The mortality of these early operations is very high. They also prefer unilateral laminectomy.

Secondary operation will be done after recovery of the scars.

From the point of view of end-results there is an absolute distinction between lesions of the cord itself and those situated in the cauda equina.

W. A. BRENNAN.

**Roux, S.: Anterior Sacral Meningocele** (Contribution à l'étude de la meningocele sacrée antérieure). *Rev. méd. de la Suisse Rom.*, 1918, xxxviii, 47.

The author gives an historical review of spina bifida, distinguishing between occult spina bifida and cystic spina bifida. The author finds only 12 cases of typical anterior spina bifida in literature, and gives short histories of these.

Particulars are given of a personal case in a male child aged eight years. In this case preliminary treatment by iodide injections failed, and the cavity was excised with obliteration of the communicating opening, closing it with several layers of catgut sutures. The author used the subumbilical laparotomy incision. This is recommended rather than the perineal or parasacral route not only for reasons of asepsis but because liberation of the tumor is easier and resection of the coccyx and sacrum is not necessitated. The child recovered and left the hospital in good condition in less than a month.

The study of this case and those reported in literature enables the author to draw conclusions regarding the following points:

1. The possibility of making a pre-operative diagnosis.
2. The rarity of anterior spina bifida.
3. Its relatively favorable prognosis.



4. The influence of a traumatism or of a pregnancy on the tumor.

5. The rather late appearance of symptoms of compression on the bladder and rectum. The case reported by the author was the only one in which this was observed in the patient from the time of birth.

6. The rarity of nervous symptoms before any operation.

7. The frequent absence of concomitant malformations.

8. The apparent greater frequency of the malformation in females. The author's case is the only one reported in a male.

W. A. BRENNAN.

## SURGERY OF THE NERVOUS SYSTEM

**Symns, J. L. M.: A Method of Estimating the Vibratory Sensation, with Some Notes on Its Application in Diseases of the Peripheral and Central Nervous System.** *Lancet*, Lond., 1918, xciv, 217.

Symns has worked out a method by which the impairment of the vibratory sensation could be estimated as a numerical ratio. He uses a tuning-fork with a vibration-rate of 108.75. Two pieces of steel are attached to the upper portion of the fork in such a manner that when the arms of the fork are vibrating, a small window is seen between them. This disappears when the vibrations of the fork reach a definite amplitude.

At the moment when the window disappears, he applies the fork to the subcutaneous bony points and starts a stop-watch. The patient is instructed to give a signal at the moment when he ceases to appreciate the vibrations. The watch is then stopped and the time recorded.

The bony points taken are the internal and external malleoli, tibia, anterior-superior spine of the ilium, sacrum, sternum, radius and ulna. By applying this method to thirty normal individuals between the ages of eighteen and thirty he found what interval of time elapsed before sensation disappeared and used this as guide in his study.

Diminution in the vibratory sensation will be found in cases of peripheral neuritis due to alcoholism and diabetes before the loss of the ankle-jerk, which in turn is before the knee-jerk. He considers this of great value as a method of foretelling the danger of peripheral neuritis. In tabes dorsalis the vibratory sensation is found to be diminished first over the lower limbs, and second over the sacrum.

The reason for choosing bony points for the application of the stimuli is that the bone acts as a sounding board, transmitting the sensation to a variable distance around. G. W. HOCHREIN.

**Ball, C. R.: Tic Douloureux and Its Treatment.** *Minnesota Med.*, 1918, i, 91.

Tic douloureux is a definite clinical entity, occurring chiefly in patients with a neuropathic predisposition. It is practically never caused by focal infection in the teeth, tonsils, sinuses, etc., consequently treatment of some existing infection does not afford relief.

Many patients give a history of having or having had migraine or epilepsy. Most of them have had surgical operations on supposed sites of infection with no relief resulting. The pain of tic douloureux has distinguishing features; it is paroxysmal, beginning and ending suddenly. It is never continuous. In most cases, the pain is started by impulse, coming from a certain area in the region of the face, hyper-sensitive gums, lips, nose, etc. These areas are called "trigger zones" by Patrick.

The treatment consists in injecting alcohol into the infected branch of the nerve or into the ganglion as indicated; the nerve supplying the "trigger zone" should also be injected. Alcohol injections afford relief in all cases for a considerable period of time. LISTER TUHOLSKE.

**Bramwell, E.: Gunshot Wounds of the Peripheral Nerves, with Reference to the Indications for Resection and Suture.** *Edinb. M. J.*, 1918, xx, 147.

The indications for resection and secondary suture of a peripheral nerve are not always clear. There is great difficulty in diagnosing the type of nerve lesion. A nerve may be completely or partly divided; it may be contused; it may be compressed from without or constricted by a scar. Complete division is comparatively rare.

If the paralysis was not simultaneous with the wound, division of the nerve may be excluded. When a nerve is superficial, direct palpation is important; it may reveal a breach in continuity, a localized neuroma, etc. Complete loss of function is not an indication for operation until there is clinical evidence of degeneration.

The following points aid in the diagnosis of complete interruption, whether anatomic, histologic, or physiologic:

1. Muscles below the seat of injury are completely paralyzed.

2. Paralyzed muscles lose their tone.

3. Affected muscles atrophy.

4. Electrical changes and mechanical excitability of the muscles are present. The reaction of degeneration occurring in a muscle does not mean that the muscle cannot spontaneously recover.

5. Disturbances of sensation in a sensory or mixed nerve occur. There are two disturbances of sensation constantly observed in cases of complete interruption: (a) absence of pain when pressure is

applied to the nerve trunk below the lesion; and (b) complete absence of pain when paralyzed muscles are subjected to pressure.

"Since the clinical signs indicative of complete interruption neither throw light upon the lesion nor upon the probabilities of ultimate spontaneous recovery; since in a certain proportion of cases this applies especially to the first few weeks after the wound and before a neuroma has had time to develop, the appearance of the nerve when exposed by the surgeon may not permit of a definite conclusion as to the advisability of resection and secondary suture; since recovery after this operation is a slow process which is rarely complete; since pronounced spontaneous improvement is often observed; and since a delay of two or three months probably affects but little the rapidity and degree of ultimate recovery after operation, it is generally regarded as advisable to delay the decision as to resection for a period of three months, by which time clinical evidence of regeneration will have had time to manifest itself."

LISTER TUHOLSKE.

**Hammond, T. E.:** The Involvement of the External and Internal Popliteal Nerves in Lesions of the Sciatic Nerve. *Brit. M. J.*, 1918, i, 397.

During the South African war the external popliteal nerve was stated to be involved nine times as frequently as the internal popliteal nerve. In injuries of the sciatic nerve during the present war the proportion is stated to be three to one. Hoffman believed it to be due to the smaller blood supply of the external popliteal, but this is the smaller nerve. The fact that the internal lies more in line with the femoral vessels and that the external is the more superficial cannot account for the disproportion, as the nerves lie side by side and bullets pass in all directions.

The external popliteal nerve supplies muscles which act against gravity and no improvement follows until proper treatment has been applied. The internal popliteal nerve supplies the plantar flexors of the ankle, the small muscles of the foot, and sensory fibers to the skin of the heel and sole, and the action of these muscles is aided by gravity. In complete division but slight deformity is usually present. In incomplete division slight pes cavus may

be present with paresis of the flexor muscles and anæsthesia, trophic changes being usually absent.

In the case of incomplete lesion of the internal popliteal associated with a complete or incomplete lesion of the external popliteal, the flexor muscles contract with the aid of gravity in the position of plantar flexion; this relaxes the affected muscles and helps their recovery, even if no treatment be applied.

In lesions of the sciatic nerve admitted to Alder Hey from other hospitals, the external popliteal was affected three times as often as the internal. In 100 cases admitted direct from France in which the wound was in the upper two-thirds of the thigh, the sciatic nerve was involved in 22. The external popliteal was involved in 21, and the internal in 19 cases.

For diagnosis of incomplete lesions of the internal popliteal nerve a most careful examination is necessary, especially if a lesion of the external popliteal be present. The author thinks that the majority of lesions of the internal popliteal nerve are never diagnosed, while lesions of the external popliteal are rarely missed.

V. C. HUNT.

**Dujarier, C., and François:** Twenty Cases of Homoplastic Grafts in Nerve Sections (Sur vingt cas de greffe homoplastique dans les sections nerveuses). *Bull. et mém. Soc. de chir. de Par.*, 1918, xlv, 43.

In cases where sectioned nerve-ends could not be brought together by traction and sutured, the authors have tried grafting. In their first 8 cases autografts were used but did not give satisfaction. In 20 more recent cases they have used homoplastic grafts, the material being obtained from amputations, etc., and preserved in frozen vaseline until required. The nerves to which the grafts have been applied have principally been the radial, ulnar, median, and sciatic. The piece grafted has varied in length from 4 to 12 cm.

The immediate operative results are good. The graft is well tolerated and in no case has it been eliminated. There has been only one case of partial suppuration. It is too early yet to speak of final results but these will be published later.

In all these cases grafting alone offered any chance of restoration of function. W. A. BRENNAN.

## MISCELLANEOUS

### CLINICAL ENTITIES—TUMORS, ULCERS, ABSCESES, ETC.

**Fleisher, M. S.:** Immunity and Tissue Transplantation; the Reactions Occurring About Tissue Transplanted into Heterologous Animals. *J. Med. Research*, 1918, xxxvii, 483.

While the histological reactions which occur about transplanted tissues in normal animals and

in immunized animals, and about homologous and heterologous transplants, have been studied by a number of different investigators in connection with transplantable tumors, there have been but few studies made of the reactions taking place where normal tissues are transplanted under similar conditions. Such a study, it seemed to the author, might have a bearing on many immunological problems.



The experiments recorded in his paper were carried out only in rabbits into which pieces of guinea-pig kidney were transplanted. They bear therefore only on the question of transplantation in heterologous animals.

There were striking differences between the histological appearances in the pieces of kidney tissue transplanted into normal animals and those transplanted into immunized animals; furthermore, there were differences in the rate of progress of events.

Considering first the distinctly different features between the normal and immunized, in the former, regeneration of the tubules took place, appearing first at two days and persisting even at twenty-eight days, while in the pieces removed from immunized animals regenerated tubules were not seen at any stage. In these latter tissues there was a very marked leucocytic reaction, and the leucocytes formed an enveloping veil about the tissue which persisted as such for a considerable period, practically up through twenty-one days.

There was less active leucocytic reaction about the pieces in normal animals and there was no distinct leucocytic veil formed about these pieces. On the other hand, the connective tissue reaction about the normal pieces was more marked than about the immune, and the invasion of the tissue by the fibroblasts was much more extensive in the former.

From his study the author draws the following conclusions:

Kidney of guinea-pigs transplanted into normal rabbits remained alive and showed regeneration even at twenty-eight days. No regeneration took place in immune animals.

Leucocytes collected in larger numbers about the transplanted tissues in immune animals than in normal animals. The leucocytes did not, however, penetrate the tissue as rapidly in the immune animals.

The connective tissue formation in normal rabbits was more rapid and more marked than in immune animals. The penetration of the pieces in normal animals by connective tissue cells was also more rapid.

While the differences between the reactions in the two kinds of animals was quite marked, it was not possible to determine the significance of these reactions. Whether serological or cellular reactions played the more important part in the processes, and what their relations were must be left, the author states, for determination by further experiments.

GEORGE E. BELLBY.

**Castex, M. R., and Queirel, J.: Moist Gangrene in Raynaud's Disease with Paroxysmal Hæmoglobinuria** (Gangrene húmeda en un síndrome de Raynaud con hæmoglobinuria paroxística). *Prensa méd. argent.*, Buenos Aires, 1918, iv, 307.

The authors report a case of concomitant Raynaud's disease and paroxysmal hæmoglobinuria in

a man of thirty-six years. The right foot showed moist gangrene.

Although the Wassermann reaction was negative, the authors believed syphilis was responsible for both maladies and instituted a vigorous antiluetic treatment. Both diseases yielded; the symptoms disappeared without recurrence, and the patient resumed his occupation.

The authors note that, although there are on record numerous cases of Raynaud's disease and of paroxysmal hæmoglobinuria corresponding with syphilitic infection, yet in the rare cases in which the two maladies were concomitant, syphilis was neither demonstrated nor definitely proved. They think that the rapid disappearance of both symptoms at the installation of antisyphilitic treatment in their own case justifies the clinical diagnosis of the syphilitic nature of this case. W. A. BRENNAN.

**Beck, C.: Conservative Surgery in Children.** *Surg. Clin. Chicago*, 1918, ii, 177.

Although Beck's article deals directly with the necessity of conservative surgery in children, he brings out the point that it should be practiced on the adult as well and that the war is teaching many lessons in this respect. There are many pathologic conditions as well as injuries which require conservative handling. To strike just the happy medium between radicalism and conservatism is a most important factor and one to be determined by the surgical tact and experience of the operator. Formerly when one had to deal with a tuberculosis affecting the small bones of the wrist, it was believed that there was an absolute indication for amputation. During the last few years through treatment with bismuth injections and X-ray and blue light, surgeons have learned to improve these conditions to such an extent that diseased bones and soft tissues can often be transformed into cicatricial and still useful bridges between the healthy fingers and the healthy forearm, and the same principle applies to knee-joint and ankle-joint affections.

As an example of the use of conservative surgery in children he cites the following case. A boy of ten years was brought to him after he had been under treatment by a good local surgeon for several weeks. The boy had had a septic infection which localized in the joints of the elbows and one foot. The elbow infection was not of such stormy character as that of the foot, where the suppuration took place within the small bones, destroying portions of them, invading the tendon sheath and causing local destruction. Fistulae necessitated incisions in different directions and the introduction of tubes for drainage, but notwithstanding this treatment the fever continued and amputation was advised.

Beck opened the foot extensively and removed all the necrotic bones, leaving the periosteum wherever it was not detached or necrotic. The cavity was quite extensive and nothing was left of the astragalus, the calcaneus, cuneiform bones, and even adjoining parts of the metatarsal bones were removed. The



greater portion of the metatarsal bones and phalanges were left and also the tendons as far as they had not been destroyed, the dorsal, external and internal malleolar arteries. The whole cavity was packed tightly with gauze and left for granulation. A few days later the foot was put in a permanent bath and the liquid changed frequently. Rapid granulation followed, filling out the cavity inside of a few weeks. The skin wound closed and the foot, though somewhat œdematous, was retained. The boy began to get around on crutches. The fever disappeared and he gained in weight. The foot was somewhat heavy and painful at night and there was no function. An X-ray picture taken a few weeks afterward showed there was some re-formation of bones, calcareous deposits being visible in places where before there had been no bone.

The pains continued and it was suggested that they might be due to some inflammatory condition. It was decided to eradicate the diseased portions of these bones and also the newly formed bone, so as to give the foot another chance to form better and less inflamed bone. This operation was performed by Emil Beck and the foot healed and the pain disappeared. At the time the case was reported the boy was beginning to walk without the aid of a crutch.

G. W. HOCHREIN.

**Koser, S. A., and McClelland, J. R.: The Fate of Bacterial Spores in the Animal Body.** *J. Med. Research*, 1917, xxxvii, 259.

The question of the ability of bacterial spores to remain latent in the tissues of the animal body has received little attention, chief emphasis having been placed thus far on the possibility of tetanus bacillus spores being carried from the point of entry to distant organs and tissues, and after periods of latency developing and producing serious disturbance.

In this study the results of previous investigators were in a large measure confirmed. Spores of bacillus tetani were recovered from the various organs and tissues after the lapse of several months following injection. Data were obtained also as to the fate of the spores of other anaerobes, namely, bacillus putrificus, bacillus œdematis maligni, and bacillus anthracis symptomatici, and of the aerobes, bacillus cereus and bacillus ramosus.

The authors present the results of their investigation in a series of tables. The spores of bacillus tetani, bacillus putrificus, bacillus anthracis symptomatici, and bacillus œdematis maligni were capable of resisting the destructive influence of the body tissues, and were transported from the site of inoculation to different organs, where they remained latent for varying periods of time. The persistence of the spores in the liver and spleen, as well as at the point of entry, the authors found of particular interest. In spite of extreme precaution, contamination was not entirely prevented, as is shown in the tables. The intruding organisms were so few, however, that they did not materially affect the results.

The spores of the aerobic organisms employed showed a marked contrast to those of the strict anaerobes in their deportment after parenteral introduction. In a very few instances only could the spores of the aerobes be recovered from the tissues, away from the site of inoculation.

The authors advance at present no satisfactory explanation of the persistence of viable spores of bacillus tetani and the putrefying organisms in the different tissues, while those of the aerobes, they state, seemed to carry on a precarious existence.

The authors' observations may prove to be of some practical interest in connection with the subject of wound infection, gangrene, and so-called blood poisoning. The results on the fate of the tetanus bacillus substantiate the work of previous investigators, particularly Canfora, Tarozzi and Francis. Similar studies of the gas bacillus, the authors believe, may furnish data of much importance.

GEORGE E. BEILBY.

### SERA, VACCINES, AND FERMENTS

**Ito, H.: The Fate of Staphylococcus Pyogenes Aureus Introduced Intravenously into Actively Immunized Dogs, and of Killed Bacteria Introduced Intravenously into Normal Dogs.** *J. Med. Research*, 1917, xxxvii, 189.

It is well recognized that the natural resistance of an animal against various bacteria can be experimentally increased, and with this there is an increase in the content of opsonin, agglutinin, and bacteriolysin in the serum of such an animal. The present study was undertaken to determine the mechanism, in so far as it could be shown by histological means, by which staphylococcus pyogenes aureus, when introduced into the blood stream, was disposed of by dogs actively immunized against it; and also to determine the disposition of killed staphylococci after their intravenous injection into normal dogs. The author therefore undertook the problem of investigating the site and rate of the disappearance of staphylococcus pyogenes aureus introduced intravenously into the dog previously actively immunized. He performed a number of experiments which he describes in this work in much detail.

From his study he found that bacteria introduced into actively immunized dogs disappeared sooner than in normal dogs and were never found growing in any part of the body.

Bacteria that accumulated in the lungs in the earlier stage were transported to the other organs, but they were not found in the spleen in large numbers, while they were more numerous in the liver.

In certain organs it appeared that both fixed and wandering phagocytes had the ability to engulf, as well as to digest, bacteria throughout all the stages.

As to the fate of killed bacteria introduced into normal dogs, they were destroyed somewhat



quicker than the living bacteria introduced into immunized dogs, and they provoked no changes evident histologically in the tissues.

GEORGE E. BEILBY.

**Mosti, R.: The Treatment of War Wounds by Polyvalent Antipyrogenic Serum** (Il trattamento delle ferite di guerra col siero antipirogeno polivalente). *Policlin*, Roma, 1918, xxv, sez. prat., 251.

Mosti uses a serum prepared in Italy by Lanfranchi and Finzi. This is a polyvalent serum with 23 microbic varieties. It may be injected subcutaneously or endovenously, or applied locally. In any case the wound is first submitted to surgical treatment. The injections are employed in infected wounds.

In wounds with latent infection the use of the serum has almost always prevented the development of the septic process or caused a marked decrease in the virulence. In wounds with positive infection the suppurative process was modified and abbreviated. It cleans up the tissues and brings about early granulation, obviating local and general complications.

W. A. BRENNAN.

## BLOOD

**Primrose, A.: The Value of the Transfusion of Blood in the Treatment of the Wounded in War.** *Tr. Am. Surg. Ass.*, Cincinnati, 1918, June.

The author in conjunction with Ryerson first employed the transfusion of blood in the present war at Salonika in December, 1915, in No. 4 Canadian General Hospital, which was established in tents on the plain at Salonika. During the sojourn of this hospital at Salonika there were some 10 cases in which transfusion was carried out in serious cases of hæmorrhage, the results obtained being most satisfactory; but in one instance hæmolysis occurred, symptoms appearing immediately after 200 ccm. of blood had been transfused. This patient subsequently died.

The author points out that surgeons were tardy in recognizing the value of transfusion of blood as a life-saving measure in cases of hæmorrhage in the wounded. This fact was illustrated by quotations from literature in which, while recognizing that saline infusion is of little value, the transfusion of blood had not been tried to any extent.

In civil practice on this continent prior to the war the immense value of transfusion of whole blood in cases of hæmorrhage was established in hundreds of instances where it had been employed. In the present war the early cases were done by Canadians who had already learned the value of transfusion in civil practice.

The author quotes in detail 2 cases of transfusion by Clutterbuck, a Canadian serving in an Imperial casualty clearing station on the western front. Both patients had multiple shell wounds, suffered from hæmorrhage and shock, and made an excellent recovery after transfusion.

The statistics of Robertson were quoted indicating his experience in 68 cases of transfusion in a Canadian casualty clearing station on the western front. The following analysis may be given of his cases:

1. Primary hæmorrhage. (a) Life-saving (evacuated to base hospital in good condition), 36. (b) Immediately beneficial but died from (1) shock, 8; (2) gas gangrene, 5; (3) capillary bronchitis, 1; (4) pulmonary embolism, 1. (c) No benefit, 4. (d) Harmful (hæmolysis), 2.

2. Secondary hæmorrhage, 9. Of these 6 recovered and 3 died. Of the 3 that died, 1 death was due to hæmolysis following a second transfusion. One died of gas gangrene three days after transfusion. One died of streptococcus septicæmia one month after transfusion.

3. Severe carbon monoxide poisoning, 2.

The casualty clearing station at which these cases were transfused was situated some eight miles from the firing line. The wounded were sent back over very uneven ground, and in bad weather the mud made transportation extremely difficult. In consequence, from six to twelve hours (occasionally as much as twenty-four hours) would elapse before the wounded man reached the hospital. An attempt was made to establish an advanced operating station, but this had to be abandoned because of the enemy shell fire. The delay, the pain and the fatigue consequent upon transportation over rough country increased the shock and collapse. Many of these patients were therefore in extremely bad shape when they arrived in the hospital. Rapid pulse and low blood-pressure were characteristic features presented. The immediate effect of transfusion was to raise the blood-pressure and to produce a slow full pulse. This is shown in the records which were kept of the individual cases and indicates a quick response to the therapeutic measure employed, the immediate beneficial effect being maintained in the vast majority of instances.

Many of these cases were desperate from the outset and it is noteworthy that of 68 cases reported, life was saved in 44 instances, i.e., 64.7 per cent. In other words, the mortality in these cases was 35.3 per cent. This would appear to be a remarkably good showing. It is worthy of note also that an immediate beneficial result was obtained in 15 of the cases which subsequently succumbed to conditions other than hæmorrhage. One is justified in concluding that the transfusion of whole blood practically eliminates the danger of death from hæmorrhage *per se*.

The experience which has been already attained in the treatment of the wounded at the front has been ample to prove the immense value of transfusion in cases of hæmorrhage, both primary and secondary. The author agrees with the conclusions of Archibald and Maclean that transfusion of blood is valueless in shock. However, when shock is accompanied by hæmorrhage, then transfusion has proved of immense value and one may conclude that its employment may turn the scale so that life in

many instances has been saved where shock plus hæmorrhage exists. In fact, one is warranted in assuming that whenever the wounded man has lost large quantities of blood, then the replacement of that blood is the ideal therapeutic measure. Such patients when transfused have the element of danger which exists from loss of blood eliminated. They are in a vastly better position to combat shock, sepsis, or the ordeal of some necessary and perhaps extensive operation or other condition which may threaten life. Transfusion, it is believed, can largely eliminate the danger which exists from hæmorrhage and by replacing the lost blood may materially aid the patient to combat other conditions which might without transfusion prove fatal. Transfusion can place the man in the position of one similarly wounded but who has lost no large amount of blood.

There are mainly two dangers to be avoided in the transfusion of blood: the transfusion of some infective disease, and the danger of hæmolysis. The donor should be carefully examined for the purpose of excluding syphilis or other communicable diseases. The blood of both donor and recipient should be tested in order to determine their isoagglutinin characteristics. As Ottenberg has pointed out, the most severe and possibly fatal reactions occur when the serum of the recipient agglutinates the corpuscles of the donor, but other conditions of incompatibility, while unlikely to cause serious disturbance, will lessen materially the therapeutic value of transfused blood.

The author was a member of the Interallied Surgical Congress which met in November, 1917, at the French Army Medical School, Val-de-Grâce, in Paris. It was then determined to investigate the value of the transfusion of blood at the following meeting, the subject to be introduced by Tuffier. Accordingly, at the last meeting of the Congress at Paris in March, 1918, this was done. After full discussion it was concluded that the results obtained by the transfusion of blood justify its being looked upon as the method of choice in the treatment of serious hæmorrhage, both primary and secondary. It was agreed that the method of transfusion employed should make it possible to measure the quantity of blood transfused. Regarding the danger of hæmolysis, it was concluded that at advanced posts it is justifiable to resort to transfusion even if it be impossible to test the agglutination, as the risk of serious results is relatively small, but it should be tested in all other units.

The surgery of the present war has been remarkable for the progressive developments which have occurred in the treatment of the wounded soldier. Many of the pet theories regarding the treatment of wounds have been ruthlessly upset and effective and revolutionary measures for the saving of life and limb have been evolved and are today successfully carried out in hospital corps from the front line to the base. For the first time in war the transfusion of whole blood has been carried out

successfully and no treatment has been more spectacular or effective as a life-saving measure in cases of hæmorrhage.

**Jeanbrau, E.: Technique of Transfusion of Blood Sterilized by Citrate of Soda** (Technique simple de transfusion du sang stabilisé par la citrate de soude). *Presse méd.*, Par., 1918, xxvi, 58.

Jeanbrau sketches the history of blood transfusion for hæmorrhage and gives a very detailed description of his own instrumentation and technique for citrated blood transfusions. In the donor the median basilic vein is stripped for a length of 4 cm. The upper end is tied with catgut. A Kocher forceps is placed on the lower end and a small incision is then made in the vein. A graduated ampulla held in the right hand is introduced into the opened vein, the left hand removing the forceps. The correct amount of citrate solution is already in the ampulla. As the blood flows into the ampulla, this latter must be kept agitated so that a thorough mixture of blood and citrate is effected. In the recipient a vein of the arm or the internal saphenous is chosen. Jeanbrau thinks it is a good point to allow the last 2 or 3 cm. drawn from the donor to escape from the ampulla because it may not be sufficiently citrated.

Jeanbrau reaffirms the simplicity and rapidity of his method, as the whole operation can be executed in less than twenty minutes. It may be made at the patient's bed and there is no danger of sepsis. It limits and measures the amount of blood taken from the donor. Jeanbrau has never exceeded 800 cm. except in the cases where donor and recipient were related by blood. The fact that venous blood is used is not objectionable, as a few respirations suffice to oxygenize the injected blood.

From the biological point of view the presence of citrate does not prevent the transformation of hæmoglobin into oxy-hæmoglobin. The citrate solution is not hæmolytic. Jeanbrau cannot find from the results of research that citrate of soda has any harmful action on the products of internal secretion of the vascular glands. W. A. BRENNAN.

**Karsner, H. T.: Transfusion with Tested Bloods, Including the Grouping of One Thousand Bloods and a Method for Use at Advanced Hospitals.** *J. Am. M. Ass.*, 1918, lxx, 769.

In this base hospital of about 1,200 beds, transfusion has been practiced forty times with properly tested bloods. In two instances, reactions were noted in the recipients, one being due to a confusion of names of donors, whereby the donor's corpuscles were agglutinated by the recipient's serum, the other being a case in which the recipient's cells were agglutinated by the donor's serum. In both cases the reaction appeared after the introduction of about 50 ccm. of the donor's blood, and the operation was immediately stopped. In neither case was the reaction fatal.

Two methods of testing the blood have been used



in this laboratory. The method of Kolmer was found to occupy a longer time for attaining results than the surgeons considered desirable. The method of Lee was used with great success.

A large list of available donors may be grouped by this method so that when a patient needs a transfusion, his blood may be quickly grouped and a donor selected from the list posted either in the laboratory or the operating theater.

The bloods of 1,000 individuals were subjected to examination by the Lee method, with the results given in Table 1:

Table 1. Classification of blood in 1,000 cases.

	Per cent
Group 1.....	3.1
Group 2.....	42.4
Group 3.....	8.3
Group 4.....	46.2
	100.0

Granting that Group 4 is the universal donor, the chances of a member of any group having a suitable donor in case the blood is not tested are as indicated in Table 2:

Table 2. Chances of having a suitable donor.

Group 1.....	493 in 1,000
Group 2.....	886 in 1,000
Group 3.....	545 in 1,000
Group 4.....	462 in 1,000

If the group percentage in each group is multiplied by the favorable chances of that group expressed as fractions of 1,000 and the results added, the total gives the chance of any individual having a successful transfusion, if the bloods are untested. This figure is 649 in 1,000.

For purposes of testing at the casualty clearing station, a team has been sent with this equipment: six microscope slides; six tubes, 75 by 10 mm.; fifty small tubes of Group 2 serum; fifty small tubes of Group 3 serum; one copper wire loop (platinum and aluminum not being available at the moment); one hand lens of 10 X magnification.

This can be packed in a tin such as carries 100 cigarettes and is thus easily transportable. The serum is blown from the tubes directly on the slide, and an equal amount of blood is suspended in physiologic sodium chloride solution, rubbed in with the loop. The slide is inverted, stands at room temperature for ten minutes and the result is read with the hand lens. The loop must be dried with a towel or blotter in going from one serum to the other, but does not necessarily need sterilization. As the serum is exhausted, a new stock can be forwarded, but because of the chance of deterioration when kept at room temperature, it is well not to send too great a stock.

EDWARD L. CORNELL.

**Kimpton, A. R.: Transfusion; Experiences in over Two Hundred Cases.** *Boston M. & S. J.*, 1918, clxxviii, 351.

Transfusion has become a definite surgical procedure and has a very definite place in the treatment of certain medical and surgical conditions as well as in the treatment of certain emergencies. Technical difficulties may be said to have been entirely overcome.

Transfusion is of value in acute and chronic secondary anæmia and in chronic primary anæmia, but not in acute primary anæmia. It is dramatically life-saving in acute massive hæmorrhage, regardless of source. If hæmorrhage is stopped, 800 to 1,000 ccm. are given; if not, as a rule, not more than 500 ccm., lest bleeding be again started by the incident rise in blood-pressure. The indication for transfusion in acute bleeding rests on the general appearance of the patient, the pulse, capillary reaction, hæmoglobin, and diastolic blood-pressure. A diastolic pressure of 50 or below indicates a dangerous condition. A sudden hæmorrhage is of far graver import than a gradual one. In cases of rapid bleeding there may be a period of cyanosis preceding the blanching.

In secondary anæmias, transfusion puts the patient into a condition to receive surgical benefit, whereas without it operation would be very dangerous, if not fatal. Cases of Banti's symptom-complex are often most successfully transfused, either before or after splenectomy.

In hæmorrhage of the newborn, transfusion is specific and nearly every case will recover provided one has not waited too long. Any baby having had a hæmorrhage large enough to show it clinically should be transfused, for such an infant is liable to further bleeding. Sixty to 120 ccm. are usually given in the longitudinal sinus, or the jugular vein in cases of hæmorrhage into the scalp.

In hæmophilia transfusion cures the attack but not the disease. The donor should not be a relative, but even the mother's blood may be used provided the agglutination test is satisfactory.

In uncomplicated shock transfusion theoretically should be of no value. However, such cases with a diastolic pressure below 50 may be greatly benefited. In shock associated with hæmorrhage, if sudden, even though small, transfusion is of great value.

In acute primary anæmia, transfusion is of no considerable value. In chronic primary anæmia it does not cure but prolongs life. If offers as much to the patient alone as splenectomy with or without transfusion. Splenectomy cases later require transfusion; furthermore they do not respond as well to transfusion as do cases not splenectomized. Care should be taken in the amount of blood given for pernicious anæmia, for too much blood may cause plethora and an aplastic state rather than stimulation of the red cell production.

The dangers of transfusion are acute dilatation of the heart, avoided by care in doing the operation,

and anaphylaxis, avoided by blood grouping. The donor should be a healthy, robust, non-syphilitic individual.

The article concludes with a detailed description of the technique, using paraffined glass containers.

C. A. HEDBLÖM.

### BLOOD AND LYMPH VESSELS

**Forgue, E.: Arteriovenous Aneurisms in War Surgery** (Les anévrysmes artérioveineux en chirurgie de guerre). *Rev. de chir.*, Par., 1917, liii, 1.

Forgue points out that arteriovenous aneurisms which were extremely rare in former wars are comparatively frequent in the present war owing to the nature and velocity of the small caliber bullet.

One of the noticeable facts is the systematic tolerance and silence of such a lesion. It is observed that important bivascular lesions involving a trunk artery and its accompanying vein large enough to create permanent anastomosis may exist and give no serious symptoms during a greater or less period of time. This fact should be borne in mind whenever the orifices of entry and exit of a projectile indicate the probability that important vessels have been injured, and should necessitate a careful and detailed systematic examination for the discovery of possible latent vascular lesions.

The operative indications may be determined by the permanency of the arteriovenous communication and the unlikelihood of spontaneous cure. There are plenty of examples in literature of such lesions existing for many years without grave results. But such relative benignity is not constant; it is more usual for such lesions constantly to progress so that the patient is exposed to the risk of a rupture and hæmorrhage. The question then arises, in what cases can a slow or even stationary evolution be hoped for, or when should a rapid progress be expected?

The author thinks that there can be no clinical certainty, and that although it is reasonable to suppose that the simple aneurismal varix without a sac would have a more favorable prognosis than a tumorous varix, yet observation does not show this to be so. In the author's practice, when intervention is practiced, it is determined by the lesion itself and has for its object the suppression of complications inherent to the lesion. The operation is preventive rather than curative of actual disturbances.

Forgue enters at length into a discussion of the choice of methods of operation, reviewing the various procedures. He thinks that the most favorable time for intervention is at the end of the first month. Hæmatomata are then resorbed; the vascular lesions are free from surrounding infiltrations; and hard sclerous perivascular formations which later give the surgeon much trouble are avoided.

Forgue thinks that the essential condition in operating is the complete separation of the arterial circulation from the venous. Any intervention which does not realize this is doomed to failure.

Arterial ligation above the site of anastomosis, while it appears the simplest and least dangerous procedure, is in reality that which most compromises the circulation of the limb. Arterial ligation at a distance, double arterial ligation, quadruple ligation, and resection of the arteriovenous segments are discussed in turn.

In order to obtain a guarantee against the re-establishment of intravascular communication, resection of the arterial and venous segments is the only radical procedure. Theoretically, the excised segment ought to be confined to the narrow limits of the anastomosis; but in practice the uncertainty of the exact points of communication and the extent of cicatricial fusion renders an economic excision difficult. Between the two vessels, between the vessels and their sheath, and between the sheath and muscles, extensive dense adhesions are formed which make the intervention quite different from the classic exposure of a vessel. The sound does not succeed in separating the artery from the vein, and it is necessary to use the knife and the scissors freely. The greatest care moreover must be observed in separating the minor regional nerves which run in the perivascular fibrous tissues.

Finally when the vessels are sufficiently exposed over a sufficient area, it must be decided whether the conditions then found call for a bivascular segmental sacrifice with quadruple ligation, or whether the arterial or the venous segment can be preserved. For arteriovenous aneurisms of the axillary, humeral, forearm vessels, and the femoral, especially at its middle third, the dissection is in general easy and is possible anatomically; but in certain other regions, such as the base of the neck, it is difficult to place quadruple ligatures and intervention can only be carried out under risk of serious hæmorrhage.

Forgue refers to the risk of gangrene from the simultaneous ligation of artery and vein, especially of the lower limb. He quotes statistics to show that this risk is high; but the figures, taken from German statistics, are high and incorrectly alarming. One fact however appears clearly, according to experience on this subject, namely, that the lower limb, contrary to the classic belief, well supports complete obliteration of its principal artery and vein over an extended segment; and that paradoxically bivascular resection is less harmful than is simple interruption by a double or quadruple ligation.

The author points out that lateral suture of the arterial and venous wounds is theoretically the intervention of choice, but in practice it is difficult, owing especially to adhesions. The history of this method since Koerte's first success in 1904 is reviewed. If it is impossible to preserve both vessels, an attempt can be made to maintain the permeability of the artery. This is to be recommended especially for the lower limb and is frequently possible. When it is impracticable, the author thinks that the method devised by Murphy, i.e., resecting the artery and reuniting the two sections by cir-



cular suture, is applicable. Some cases have recently been reported in the war, but full details are lacking, and it is very desirable that full reports be published of any such operations carried out. Similarly for double resection and circular suture of artery and vein, which has also been done in some cases. The author thinks that while theoretically this bivascular circular suture is a method of choice when suture cannot be done, yet in practice its realization remains problematical.

The author finally comes to the conclusion that all surgeons who have endeavored to limit their interventions to conservative or reparatory procedures in arteriovenous aneurisms of war have been led by the facts to the admission that the most radical surgery is the surest. W. A. BRENNAN.

**Favre, R.: Obliteration of the Superior Vena Cava; Four Personal Cases** (L'obliteration de la veine cave superieure; quatre cas personnels). *Rev. méd. de la Suisse Rom.*, 1918, xxxviii, 97.

Favre reviews the literature covering cases of obliteration of the superior vena cava either by compression or destruction of the vein or by phlebitis, spontaneous or otherwise. Favre confines himself to cases of obliteration by spontaneous phlebitis; to 5 cases found in literature he adds 4 personal cases.

In his 4 cases of specific thrombophlebitis, each of which was established at autopsy, Favre finds a syphilitic etiology. As regards pathogenesis, the inflammation may originate either primarily in the walls of the vein or in the neighboring bones. Syphilitic phlebitis originates in specific alterations in each layer of the venous wall, followed by a more or less extensive thrombosis of the vessel.

The clinical symptoms are those due to venous occlusion, i.e., venous stasis in the upper half of the body. Prognosis will depend on the prompt establishment of sufficient collateral circulation.

Physical and radiologic exploration, as well as the history, will establish a diagnosis and the treatment should be energetic and specific. W. A. BRENNAN.

## POISONS

**Decreton: Ignored Syphilis and Surgery** (Syphilis ignorée et chirurgie). *Rev. gén. de clin. et de thérap.*, Par., 1917, xxxi, 710.

The author reports the three following cases: (1) excision of the breast for tumor; (2) resection of the knee for a white tumor; (3) resection of the toes for osteitis. In these cases there had been no clinical or other evidence which suggested syphilis. Operation, however, did not prevent the further development of the primary disease, and in course of time each of the patients came back for further treatment. Further examination and the results of Wassermann tests showed that syphilis was the cause in each case. Vigorous antisyphilitic treatment arrested further development.

The author draws attention to the necessity of instituting biologic tests in all doubtful cases, as vigorous treatment for syphilis may obviate surgical operations which may also be ineffective.

W. A. BRENNAN.

## ROENTGENOLOGY

**Cameron, D. F.: Aqueous Solutions of Potassium and Sodium Iodides as Opaque Mediums in Roentgenography; Preliminary Report.** *J. Am. M. Ass.*, 1918, lxx, 754.

A 50 per cent solution of potassium or sodium iodide of the depth ordinarily used in roentgenographic work is almost completely opaque to the roentgen ray. If such a solution is for convenience called "full strength," the half and quarter strengths cast very definite shadows.

These solutions are made with little trouble or expense. They are stable, saline to the taste, but not irritating except on areas freshly denuded of epithelium. They are miscible with urine and blood without causing precipitation or coagulation. The simple aqueous solution is neutral in reaction and is easily sterilized by boiling.

Good roentgenograms of the human bladder filled with a 15 per cent potassium iodide solution and of chronic sinuses filled with a 50 per cent solution have been made. No bad effects have been noted. A 25 to 30 per cent solution should be sufficient for good pyelograms. Caution, however, should be observed in the use of these solutions in human subjects until further study of their effects has been made.

EDWARD L. CORNELL.

**Levin, I., and Levine, M.: The Biological and Clinical Evidence of the Therapeutic Value of Radium and Roentgen Rays in Cancer.** *Ann. Surg.*, Phila., 1918, lxxvii, 442.

In a recent publication referred to by the authors, a series of cases of carcinoma was given in which clinical arrest of the disease was obtained, accompanied by a complete absence of morphological changes in the tumor tissue due to the use of radium and the X-ray. The conclusion was drawn that the first effect of the rays consisted in the inhibition of the proliferating power of the cancer cells. Subsequently, the destruction of the cancer cells took place and sclerotic tissue was formed.

The life of an individual cancer cell is short and changes rapidly from an embryonic into an adult and then into an aged degenerated cell. Before reaching maturity each cell divides into two daughter cells and when the rays arrest the proliferation, each cancer cell matures, degenerates and dies. Rays may deeply affect one class of cells and produce no influence whatever on the other cells of the organism.

To obtain data related to the condition in human cancer, the authors studied the tumor formation in plants, known as crown gall. This is a condition

found in a great variety of plants and is due to a parasite, which may be produced artificially by inoculation. In the opinion of Smith who has studied it continually for the last ten years, it is identical with animal and human cancer.

To carry on the experiment showing the influence of the roentgen rays on the development and growth of crown gall, 43 plants were inoculated and roentgen ray treatment followed. Control plants were similarly inoculated. Four weeks later, tissues were taken for microscopical examination. At that time, all of the control plants had developed a large crown gall, while a majority of the radiated plants either showed no trace of the inoculation or merely a minute swelling at the point of inoculation. Radiated and non-radiated carcinoma tissue may have the same microscopic appearance, and still the former tissue is sterilized and may have lost to a great extent its power of proliferation and consequently its clinical malignancy.

The practical conclusion to be derived from these clinical and experimental investigations is the following: It is advisable to radiate malignant tumors not only after an operation, but in a certain class of cases also before operation so as to sterilize and inhibit the proliferation of those cancer cells which may be left behind or transplanted elsewhere in the course of an operation. Such a procedure does not prolong appreciably the time preparatory to an operation and presents no danger to the patient.

The fear expressed by some clinicians that the raying may occasionally irritate and increase the rate of growth of the tumor is unfounded. There is no clear experimental evidence of such irritating action of the rays on young proliferating cells. The result is always an inhibition. The clinical evidence of the existence of an irritating action of the rays is also very vague and not convincing. One must keep clearly in mind the fact that any malignant tumor may suddenly increase its rate of growth and consequently its malignancy without any relation to the instituted mode of treatment.

C. B. HOLLINGS.

**George, F. W.: The Importance of the Position of the Upper Arm in the Detection of Roentgenological Shadows in the Region of the Shoulder-Joint.** *Am. J. Roentgenol.*, 1918, v, 187.

The author found that in certain cases antero-posterior or postero-anterior plates of the shoulder-joint failed to reveal existing concretions in the subacromial region but that these could be shown clearly if the exposure were made as follows: "with the patient in the recumbent posture, the affected shoulder flush on the plate, the upper arm abducted to a right angle, rotated outward, the forearm flexed at the elbow to about 45 degrees, and the opposite shoulder slightly elevated by a sand-bag."

In addition to the above three positions a roentgenogram made with the patient in the prone

position and upper arm abducted is considered absolutely essential if subdeltoid shadows are to be excluded. Attention is called to the doubtful origin of these shadows and the possibility of their disappearance by treatment other than surgical removal.

ADOLPH HARTUNG.

**Lawrence, W. S.: A Method of Obtaining an Accurate Lateral Roentgenogram of the Shoulder-Joint.** *Am. J. Roentgenol.*, 1918, v, 193.

The method consists essentially of directing the central ray from the axilla of the opposite side through the mediastinal structures upon a plate resting against the shoulder wanted. Its object is not to supplant but rather to supplement stereoscopic exposures. It gives a true lateral view of the joint, is applicable in practically every case, and subjects the patient to no pain or inconvenience.

ADOLPH HARTUNG.

**Walton, H. J.: Roentgenological Examination of the Mediastinum.** *Am. J. Roentgenol.*, 1918, v, 181.

This paper may best be summarized by the author's conclusions, which are as follows:

Aneurismal shadows vary according to their location, and always show intrinsic pulsations. They are never nodular in form.

Sarcomata usually show clear-cut shadows, which are irregular or nodular in character. They are rarely symmetrical and often assume large proportions.

Spindle-cell sarcomata are invasive growths with indefinite outlines, extending, as a rule, equally in all directions.

Carcinomata do not have a typical roentgenological appearance. They usually metastasize by means of the lymphatics. The lungs are often involved and show signs of malignant infiltration.

Hodgkin's disease usually shows irregular and nodular shadows due to the hyperplasia of the mediastinal glands, and is generally accompanied by lung infiltration similar to that of tuberculosis. It is not uncommon to find the axillary and supraclavicular glands also enlarged. In children enlarged mediastinal glands are nearly always tuberculous, and frequently show deposits of calcium.

Dermoids and teratomata generally occur high in the mediastinal region, on either side of the median line, and show clear-cut symmetrical outlines. They may easily be mistaken for aneurisms.

Abscesses as a rule are centrally located, and if of long duration often contain calcium deposits within their walls. Their shadows are generally uniform in outline.

A characteristic sign, and often a determining factor in diagnosing mediastinal tumors, is the displacement of the trachea either to the right or left of the median line.

ADOLPH HARTUNG.



## MILITARY SURGERY

NOTE.—Readers are referred to the Table of Contents for other articles dealing with military surgery which appear under the various headings according to our anatomical arrangement.

**Vivie: Functioning of Advanced Army Surgical Posts** (*Réflexions sur le poste chirurgicale avancé*). *Presse méd.*, Par., 1918, xxvi, Supp., 228.

The author gives some interesting details of the functioning of his advanced surgical posts between July and December, 1917. This post was situated five kilometers from the trenches and connected with the very advanced casualty clearing stations by automobiles permitting rapid evacuation. All "non-transportable" wounded in one army corps were sent to this station. Of a total of 3,457 wounded in this period, 305 were classed as unfit for transport.

These were distributed as follows: abdominal penetrating wounds, 64; thoracic penetrating wounds, 48; thoraco-abdominal wounds, 14; multiple torn wounds, 150; severe penetrating cranial wounds, 29.

Of the 305 received, 176 have been operated upon, 95 were deemed inoperable, and 34 were treated expectantly.

The large amount of inoperable cases shows that about one-third of those received are beyond surgical help in spite of all care given them. These show mostly multiple wounds of the abdomen and thorax, and die in a state of shock.

The two main clinical aspects which cause the surgeon to defer operation are: (1) extreme anæmia following hæmorrhage; (2) profound physical and nervous depression. The author thinks that these conditions can still be improved. Hæmorrhage can and ought to be better combated by an early and well applied hæmostatic band at the front. In limb wounds especially, the early, judicious, and systematic application of an elastic band greatly betters the prognosis, and since the distance between the first aid station and advanced surgical post is small, the inconveniences attributed to the method are negligible.

The profound depression which constitutes shock properly so-called is according to the author a factor of the time elapsed since injury. The shock is directly proportional to its duration. Hence extra rapid evacuation is necessary to save a large number of such cases. It is necessary to multiply the advanced surgical posts, and to increase the medical service at the trenches to the greatest possible degree of celerity and efficiency. A couple of hours gained here may save a man's life.

The results obtained in the advanced surgical posts were as follows: Of the 305 received, 120 had been evacuated in good shape; 185 died. These 305 patients were condemned if their evacuation and treatments had been deferred even a few hours. The results must be judged from the fact that the advanced and early surgical treatment saved 120 of

them. The principal operations done in the advanced surgical posts were laparotomies, amputations, ligatures, disarticulations, esquillectomies and thoracotomies.

This surgery of the extreme front is very peculiar in character. It is under continual bombardments, attacks, and counter-attacks. It is peculiar on account of the multiplicity and the severity of the injuries and the necessity of evacuating the operated patients as soon as possible. The work is quickly done and the men passed on within a few hours. The work is done in a dug-out under fire of the enemy and many of the patients die on the spot. Under such circumstances the author has made 32 blood transfusions by the Jeanbrau citrated method with admirable and rapid results. Like everything else, it must be done at once.

An advanced surgical post to fulfil all its indications must meet the following requirements:

1. It must be close enough to the trenches so that the wounded can reach it within two or three hours after injury.
2. It must be sufficiently protected against bombardment so that the surgeon can operate in tranquillity and the wounded feel safe.
3. It must contain the following as a minimum: heating and reception chambers; radiologic, sterilizing and operating rooms; rooms for dressings and septic operations; and hospitalization for the patients.
4. The surgical equipment and personnel should be in every sense complete.
5. It must be able to receive some slightly wounded men who can be used as donors for transfusions.
6. It must be assured of means of rapid, comfortable evacuation to the rear hospitals.
7. Its action must be supplemented by (a) the early use of the hæmostatic band at the front; and (b) by the greatest degree of celerity in the evacuation of patients from the first aid and casualty clearing stations.

W. A. BRENNAN.

**Connellan, P. S.: War Surgery in an Indian General Hospital in Mesopotamia.** *Bristol M.-Chir. J.*, 1917, xxxv, 113.

The author was stationed in a base hospital in Mesopotamia halfway down the line of communications. The transportation of the sick and wounded was mainly by river boat, the journey usually being a very protracted one. Emphasis is placed on the advisability of putting the men to bed immediately, giving them a complete change into hospital clothes and as much of a bath as possible. The sick were given some warm food, especially milk if available.

After the men were comfortably settled, and not until then, were the dressings changed. At this time all dressings were removed and clean ones applied. Morphine and soporifics were given sparingly the first night. Medical and surgical treatment was as simple as possible. Surgical proceeding whether in dressing or operating was conservative. Open air dressings although approved of were not done because of the dust and sand. Bichloride of mercury was used in wound treatment and was found to be most efficient; it was easily obtained, readily made, and not affected by the climate. All foreign bodies were removed; this was done not only to prevent subsequent infection or to relieve a present one, but to satisfy the Indian sepoy, who, it seems, has an almost superstitious dread of a foreign body.

R. B. BETTMAN.

**Derkel, D.: The French Sanitary Service.** *Mississippi Valley M. J.*, 1918, xxv, 65.

Multiple wounds of the same individual are the rule in this war and they are always serious because of the intense shock caused by the wounds. Derkel received 97 shrapnel wounds from the bursting of one shell. Bullet wounds are not taken much account of in the field hospitals. These multiple wounds and the shock are more severe because of the delay in treatment. Complications set in such as gangrene and septic infection. The first aid which everyone carries in his pocket is far from sufficient for such wounds.

During the first retreat it was necessary to evacuate the advanced zone as rapidly as possible, and the first aid consisted in preliminary disinfection with tincture of iodine and the application of bandages. Ordinarily the wounded were taken by stretcher bearers from the first aid dressing stations to the field hospital where a system of disinfection would be made and operation performed when necessary. During the retreat, the field hospitals, being a link in the advancing chain of the Sanitary Service, had to move and it was necessary to move the patients immediately to the hospitals in the rear. The wounded were so many that in a few hours 400 or 500 in terrible condition would reach these hospitals and overwhelm the staffs. Since the battle of the Marne the aspect has been changed, since it is a stationary war, and the Sanitary Service, in spite of having lost in personnel and material, renders more efficient service.

Now they start at the regimental dressing station and the wounded are then transported to the stationary field hospitals and classified. These hospitals are served by sanitary automobiles of the army corps. Such stations should have very good oculists with material for glasses.

For more direct communication bicycle men should be attached, one to the battalion surgeon,

one to the regimental surgeon, and one to the chief surgeon of the field hospital. For the chief surgeon of the division and the chief sanitary surgeon, motorcycles for rapid transportation of messages have been provided. These two surgeons are also supplied with automobiles.

The medical personnel is now 9 instead of 7 in a regiment. There is a total of 48 wheeled stretchers and 48 supplemental stretchers for a regiment of the army corps of two divisions. There are also four-wheeled carriages for each regiment. The sanitary automobile sections of the army corps are used for transporting wounded in some instances, from the very limit permitted by technical conditions, to the field hospitals, to the observation hospitals, to the stationary hospitals, and to the central hospitals. They take the wounded from the dressing stations to the rear with a surprisingly small amount of delay.

The transportation service has been divided into three parts. Each part has 10 ambulances that can carry 30 wounded lying down or 40 sitting up. In addition there are the stretcher wheel bearers to transport dressing materials, and two touring cars, one for the commanding officer and one for the adjutant. An automobile is put at the disposal of the chief medical officer of the Medical Reserve Section. In spite of the very efficient field hospitals, surgical automobile ambulances are utilized which are equipped especially for emergency surgery for the seriously wounded, including sterilizers for dressings and instruments. With each surgical automobile ambulance there are 2 surgeons and 2 chief anesthetists, each one being on duty for eight consecutive hours. There are also groups of motor trucks used to carry materials and each carries an operating room with materials for surgical shipment. Ninety of these groups are in service on the French front and 50 more have been prepared for special work in the Sanitary Service.

First aid dressing stations are established close to the point of battle and these are especially necessary since asphyxiating gases are being used. Large, warm rooms free from dust are established, where inhalations of oxygen, simple fumigation with menthol, or subcutaneous injections of caffeine are given. These cases should not come in contact with other diseases.

Subterranean stations are established with apartments 18 or 20 feet long for the classification of cases, an examining room where antitetanic serum is given, and a dressing and operating room; a dormitory for the personnel of the station, an eating room for the wounded after operation, a sterilizing room, wash room, kitchen, latrines, etc. Every surgical unit of this kind costs about \$20,000.

Base hospitals and hospitals in the interior are not described in detail.

CARL R. STEINKE.



# GYNECOLOGY

## UTERUS

**Stone, W. S.: An Estimate of Radium Therapy in Uterine Cancer.** *Am. J. Obst.*, N. Y., 1918, lxxvii, 390.

Stone's report is based upon a study of 400 cases of cancer in which radium has been employed, 80 cases of uterine involvement being under observation at the time this paper was prepared. For purposes of classification the author divides his cases into four groups, the extremely advanced, the advanced, borderland lesions, and early lesions. In addition are the cases after operation and those in which radium may be used after operation as a prophylactic agent. He summarizes his observations as follows:

1. It is an agent peculiarly suitable for the treatment of uterine cancer, and is more effective for the arrest of the progress of the disease, as it is ordinarily presented to the clinician, than any other method that has hitherto been employed.
2. It is more effective in primary lesions than in recurrences.
3. It will occasionally relieve pain in the terminal stages of the disease.
4. It will relieve pain, stop hæmorrhage and discharge, and restore the general health in a large number of advanced lesions more effectively than any other agent.
5. It will convert borderland lesions into such as are plainly operable, and without surgery it will effect a disappearance of the gross evidences of the disease, and will restore health in a large number of such lesions much more effectively than surgery alone has hitherto been able to do.

CAREY CULBERTSON.

**Mills, H. W.: Sarcomatous Degeneration of Uterine Fibroids; Report of Two Cases.** *Interst. M. J.*, 1918, xxv, 230.

The author reports two cases of sarcomatous degeneration of uterine fibroids and gives a résumé of the recent literature on the subject.

He refers to the relative frequency of this sequela and insists on the careful routine microscopic examination immediately subsequent to the removal of all uterine fibroids; only in this way will a correct estimate be arrived at of the frequency of this complication, a complication which must materially affect the ultimate prognosis in these cases.

He insists on the fallacy of an opinion based on a cursory postoperative macroscopic examination of such tumors and quotes Winter who found a percentage of only 3.2 in a series of 500 cases in which microscopic examination was made in

"suspicious cases" only, but in a further series of 253 cases in which a routine systematic microscopic examination was made, found that the proportion rose to 4.3 per cent.

**Cernezzi, A.: Surgical Intervention in Uterine Fibromyomata** (Sull' opportunità dell' intervento chirurgico nei fibromiomi uterini). *Ann. di ostet. e ginec.*, Milano, 1917, xli, 143.

The author has operated in 50 cases of uterine fibromyoma. Of these interventions, 47 were subtotal hysterectomies and 3 were total, with the accompanying removal of both adnexæ in 20 cases and the removal of one only in 18 cases. There has been no fatality.

While the generally accepted methods of executing subtotal hysterectomy have been followed, there are numerous points of technique which contribute to the good or bad results of an operation. The author adopted spinal anæsthesia in 31 cases. In 19 cases prior to 1911 he used chloroform. For the spinal anæsthesia he injects 10 cg. of 5 per cent tepid novocaine in the fourth lumbar space. Twenty-five cg. of caffeine are injected before the novocaine. The author remarks that French rubber gloves of the Chaput model are preferred to the American gloves.

A left paramedian incision is made usually. The rectus is opened about a finger-width outside the median line, which gives better reunion than an exactly median situation. In some cases the Pfannenstiël and Bardenheuer transverse incision has been employed. Section of the broad ligaments is usually begun from the right side.

In his earlier cases the author used cigarette rubber abdominal drains, but since 1912 he has discontinued drainage, which he considers not only useless but dangerous except in rarely indicated cases.

No serious incident disturbed the postoperative course of any of the author's 50 cases. All the patients were able to be up by the tenth to the fourteenth day. There were 2 cases of postoperative hernia, in one of which a cigarette drain had been used. Forty of the patients have been reviewed at a considerable time after operation and the excellent condition warrants the author in his views regarding the advantages of abdominal subtotal hysterectomy for fibromyoma.

When it is remembered that thirty years ago abdominal hysterectomy for fibroma gave a 25 to 30 per cent mortality, it appears marvelous that technical progress has evolved an almost innocuous operation. The present operative mortality is less than 1 per cent and in some cases even zero.

W. A. BRENNAN.

**Frank, J.: Obstructive Dysmenorrhœa and Sterility; a New Operation.** *J. Am. M. Ass.*, 1918, lxx, 985.

The operation recognizes the value of the posterior incision in straightening out the cervical canal and so correcting the stenosis at the internal os. The cervix is grasped at the uterovaginal junction with small uterine tenaculum forceps, one on each side, and pulled outward and upward. An incision is made in the middle of the posterior lip extending well up to and past the flexion. The tenacula are then removed and used to spread apart the two halves of the posterior lip. With a very small-bladed, spear-shaped knife made on the catlin order, wedges of tissue are removed from the two raw surfaces of the posterior lip, leaving a trough. Just enough tissue is removed to allow easy and exact approximation of the entire cervical and vaginal surfaces. The first suture is commenced at the angle of the posterior incision and extreme care taken to approximate accurately the internal cervical and the vaginal mucosa at this point. This is important to avoid healing by granulation and so secondary contraction. Twenty or forty day No. 1 chromic gut is used in a continuous or interrupted suture.

The original Pozzi operation is ideal in cases of true "pin-hole" os, that is, for obstruction at the external os. But in many cases the dysmenorrhœa and sterility result from angulation of the utero-cervical canal at or near the internal os. The author's experience leads him to believe that angulation never takes place above the internal os. This angulation is completely done away with by the operation described, by eliminating entirely the canal below the angulation, as the posterior incision extends up to and beyond this point.

EDWARD L. CORNELL.

**Pemberton, F. A.: Hæmorrhage from the Uterus in the Non-Pregnant Woman.** *Boston M. & S. J.*, 1918, clxxviii, 485.

Pemberton divides the causes of uterine pathologic bleeding into pelvic and extrapelvic; the latter is seen occasionally in acute infectious diseases, especially influenza, nephritis, chronic passive congestion from cardiac disease, and arteriosclerosis. Rarely is the hæmorrhage bad enough to endanger the patient's life. Pelvic causes should always be searched for first. Almost every gynecological condition is accompanied by either menorrhagia or metrorrhagia or both at some stage of the trouble. A bloody vaginal discharge before puberty may show the rare condition of sarcoma of the cervix. Profuse menorrhagia in the first decade after puberty may show no definite pathology, though several theories for the cause have been advanced but not proven. Occasionally cervical polyps and erosion of the cervix are responsible for the bloody discharge.

During the period of sexual maturity there are many and varied causes for bleeding. Following completed or interrupted pregnancy there may be

retained placenta, chorio-epithelioma, or puerperal sepsis. Regarding inflammatory diseases, in acute salpingitis there is usually menorrhagia and metrorrhagia, though not serious. In the chronic stage the menorrhagia is due to chronic passive congestion. In tuberculosis of the tubes when the process extends to the endometrium, in about two-thirds of the cases there is a watery, bloody discharge, following the primary amenorrhœa, which is of great significance. Mucous polyps are a frequent cause of bleeding, especially when they become necrotic. They increase in frequency toward fifty years of age. The cervical polyps are often multiple in number and rarely cause serious bleeding.

Fibroids frequently cause menorrhagia, but only when they are submucous, necrotic, undergoing malignant degeneration, or when they cause a retroversion with the resulting passive congestion. Some cases of retroversion and prolapse have menorrhagia. Non-malignant tumors of the ovaries show some bleeding only in cases of twisted pedicles. Malignant tumors of the ovaries frequently cause irregular flowing and menorrhagia.

Toward the climacteric period there are two forms of menorrhagia; one with a large uterus, and no other evident pathology; the other shows a polypoid gland hypertrophy of the endometrium. Lacerated cervix and erosions also cause bloody discharge. At this time cancer should always be thought of, though no age is cancer-proof. After the menopause, all bleeding should be considered with the greatest suspicion. It ought to be taken for granted that bleeding in a woman over seventy years indicates cancer of the fundus of the uterus. According to the author's figures, 45 per cent of women bleeding after the menopause have cancer.

Senile vaginitis is characterized by a bloody discharge of a watery consistency which often irritates the vulva, causing pruritus.

As to diagnosis and treatment of the various conditions; chorio-epithelioma is rare and early diagnosis rather difficult. A sudden hæmorrhage, following either shortly or even months after the passing of a hydatid mole, miscarriage, or labor should be investigated by examining the uterus carefully with a curette, the patient being etherized. The growing of a bluish tumor from the cervix is diagnostic evidence. The curetted tissue will show syncytium and Langhan's cells. Chorio-epithelioma grows rapidly and early diagnosis and treatment are very important.

Bleeding in puerperal sepsis due to retained placenta will be relieved when the latter is removed and the endometritis cleared up.

Fibroids are usually easily diagnosed. The small submucous variety require ether examination and the aid of a curette to map out the uterine cavity. Those showing rapid growth are best taken out. One or two per cent of all cases show the fibroid undergoing sarcomatous degeneration. Small uterine polypi of the endometrium cannot always be diagnosed even by the curette. If it seems best



not to use the X-ray, and at the same time desirable to save the uterus, the latter should be opened, and if possible, the polypi removed before hysterectomy is attempted. Polypoid gland hypertrophy can be diagnosed only by the curette. Early cancer can only be diagnosed by means of the microscope. Adenocarcinoma of the fundus nearly always occurs after the menopause. Bleeding in cancer is rather a late symptom, and the diagnosis should be made early. Carcinoma may be associated with other non-malignant conditions, and finding the latter should not prevent the search for the former. Menorrhagia in young girls should be treated by rest in bed during menstruation and proper attention to hygiene, exercise, mode of life, etc. If no improvement is apparent in two or three months, pelvic examination under ether is advisable. Tightly packing the vagina with gauze, the inner end saturated with iodine or alcohol, will control the bleeding. Drugs are of little benefit. Pituitrin is worth trying. Dilatation and curettage is of value in some cases.

The uterine insufficiency in the young and the old is satisfactorily treated by X-ray and radium. X-ray requires large doses for from nine to eighteen weeks to produce amenorrhœa, while one treatment of radium will do the same. Radium is especially valuable in controlling the bleeding from inoperable cancer of the cervix. Occasionally it seems to stimulate the growth of the tumor, hastening fatal termination. Care must also be taken not to cause vesicovaginal and rectovaginal fistulæ, which may follow the application of strong doses.

L. R. GOLDSMITH.

**Robins, C. R.: The Pathological Uterus at the Menopause.** *Am. J. M. Sc.*, 1918, clv, 313.

The operation of hysterectomy was done upon 58 women who were forty years old and over. In 28 the operation was performed for fibroids, pelvic inflammation, and other conditions in which the impossibility of conserving the organs was manifest and beyond dispute. In the remaining cases, cancer was either a positive or a possible diagnosis. In 4 a positive diagnosis of cancer of the cervix, afterward confirmed by the microscope, was made and a Wertheim operation, preceded by cauterization with the Percy cautery, was done. In 26 a diagnosis of chronic metritis, including in this induration of the cervix, was made and a possibility of malignancy considered. In practically all of these patients bleeding from the uterus was a prominent symptom, manifesting itself as irregular or continuous bleeding, and sometimes accompanied by marked anæmia. In 2 cases cancer of the fundus was found on opening up the uterus.

The author has come to the following conclusions and has made them the basis of his practice for some years:

1. In cases considered favorable for cure after operation, it is not always possible to make an exact diagnosis.

2. In an effort to make an exact diagnosis, one is liable to lose the advantage of an early operation by an effort to secure tissue for examination, in this way disseminating cells and stimulating vicious growth.

3. A pathological uterus is potentially a malignant one, and even if cancer is not already present, it may develop later.

The line of safety, therefore, requires that in those cases occurring in women about the menopause or after, where the symptoms and physical findings would suggest the possibility of malignancy, the procedure should be a total extirpation of the pelvic organs and the pathological investigation made after the organs have been removed. In 26 such cases cancer was found in 2, or in slightly less than 8 per cent.

These conclusions are based upon the consideration of malignancy alone, but there are other very excellent reasons for removing such uteri. In the first place they are pathological and have produced enough symptomatology to cause the patient to consult the physician. The pathology has usually existed for a long period of time and the alterations have become so permanent that conservative measures are liable to be disappointing in results.

EDWARD L. CORNELL.

#### ADNEXAL AND PERIUTERINE CONDITIONS

**Pages, F.: Giant Para-Ovarian Cyst.** (Quiste para-ovarico gigante). *Rev. de med. y ciruj. de la Habana*, 1918, xxiii, 105.

The case reported by Pages is interesting on account of the enormous size of the cyst. The patient was a white woman aged twenty-eight years. The abdomen was first noticed to increase in size at the twentieth year and continually increased till she came to the clinic, when the umbilical circumference measured 1.8 meters. A diagnosis of para-ovarian cyst was made and the woman was operated upon.

A median infra-umbilical laparotomy was done; the tumor was adherent to the parietal peritoneum. It was stripped from its surroundings and punctured with a trocar which withdrew 46 liters of colorless and transparent fluid. The cyst was not pediculated and was inserted in the broad ligament. It was totally enucleated. The uterus and right adnexæ were normal. The left adnexæ were greatly enlarged.

The cyst was an unilocular hyaline cyst and on account of its proximity to the ovary ought to be included in the category of para-ovarian cysts.

Before operation the distance from the pubis to the xiphoid measured 90 cm., and on incising down on the cyst an incision approximately one meter in length was necessary.

The woman made an uneventful recovery and was up in less than a month. The author has not been able to find in literature a para-ovarian cyst equalling this in dimensions.

W. A. BRENNAN.

## EXTERNAL GENITALIA

**Rawls, R. M.: A Preliminary Report of an Operation for Cystocele.** *Am. J. Obst., N. Y.*, 1918, lxxvii, 359.

The author bases his work on the anatomy of the pelvic structures as outlined by Piersol and Cunningham, and his operation consists in the overlapping of certain layers of fascia after careful dissection. Technically it commences with a median incision through the anterior vaginal mucosa and underlying connective tissue. These cut edges are retracted and the incision carried forward until in the midportion the bladder can be demonstrated by blunt dissection. This is continued downward until the cervical attachment of the bladder pillars and the so-called uterovesical ligament are demonstrated. The latter is cut with scissors, keeping well in midline in order to avoid severing any of the cervical attachments of the bladder pillars.

The bladder is next separated by blunt dissection as far up as its peritoneal reflexion from the cervix and well out to either side, care being taken to free it from the underlying pillars upward to the urethra. If there is an urethrocele the dissection is carried up to the external urethral orifice. When the bladder is well mobilized its pillars are dissected from the underlying vaginal mucosa.

The next step must be done carefully in order to avoid destroying or buttonholing the fascial sling. With a finger under the mucosa as a guide, the thinned-out fascial edge is dissected with a knife from the underlying mucosa. The mucosa flap is made paper-thin and forceps are applied as tractors to the fascial and mucosal edges. This cutting dissection is continued from the midline, downward and upward for a short distance laterally until a distinct line of cleavage can be demonstrated the whole length of the primary incision, after which further separation by blunt dissection is secured from the overlying pillars well out on either side to the "arcus tendineus."

The bladder and its true lateral ligaments are now freely mobilized and the latter are overlapped from side to side by transverse mattress sutures of kangaroo tendon, one or two sutures entering the cervical tissue at the level of the internal os. These sutures prevent anteroposterior shortening of the anterior vaginal wall and draw the underlying fascia smoothly under the overlapping fascia. The cervical

suture re-attaches the fascia to its original place on the cervix and forms a shelf on which the bladder rests. The free edge of the overlapping fascia is then closed over the underlapped fascia by interrupted kangaroo-tendon sutures. The thin vaginal mucosa flap is now excised for a short distance on either side and its edges approximated in midline by interrupted chromic catgut.

Rawls claims that:

1. This technique offers a strong and anatomical restoration of the supports of the bladder without causing anteroposterior shortening of the anterior vaginal wall.

2. It gives promise of restoring the anatomical relations of the bladder and of preventing the many abnormal conditions found by cystoscopic examination in the bladder after a cystocele operation.

3. The method is applicable to all forms of cystocele, but in the presence of complete prolapse of the uterus, other methods must be used in addition, to relieve the injury to the posterior segment of the "holding apparatus" and the injury to the "supporting apparatus."

CAREY CULBERTSON.

## MISCELLANEOUS

**Caouette, J.: Notes of Gynecologic Practice** (Notes de pratique gynécologique). *Bull. méd. de Québec*, 1918, xix, 233.

The author relates a curious and rare case of ectopic pregnancy, the ovum being developed in the neck of the uterus. The patient was a nullipara of twenty-three years, with a history of a two months' pregnancy. She was brought to the hospital on account of sudden profuse and continuous hæmorrhage accompanied by pain in the lower abdomen. The case was believed to be one of abortion.

On examination the vagina was found filled by a violet-colored tumor. A curette brought away clots and a disrupted ovum which was very adherent to the internal face of the tumor. After examination the author found that the tumor was the distended uterine neck. Its internal orifice was closed. The body of the uterus was normal. The author states that the fecundated ovum was grafted and developed in the neck; and abortion was produced when the limits of distention were reached. There is no question as to its being a secondary development of an ovum primarily developed in the uterine cavity.

W. A. BRENNAN.



## OBSTETRICS

### PREGNANCY AND ITS COMPLICATIONS

Losee, J. R.: *The Cæsarean Scar; an Anatomical Study.* *Bull. Lying-In Hosp.*, N. Y., 1918, xi, 228.

The following observations were made from twenty different specimens of uterine scar removed from the uterus at or near term. All the previous cæsareans were the transperitoneal operation of the high incision type. In nine there was a complete or partial rupture of the uterus and in eleven an incision was made either through the old scar or adjacent to it, and the whole scar or the edges were afterward excised for examination. Many specimens were taken while the uterus was partially contracted, and others after rupture with complete contraction.

In a clean wound after incision, leucocytes, red blood-cells, fibrin and later young connective-tissue cells separate the surfaces. These are afterward absorbed and eventually the muscle and fibrous tissue strands separating the muscle bundles assume the relationship normally observed in other areas of a postpartum uterus. Other than thickened peritoneum, there is no scar tissue observed macroscopically or microscopically in the myometrium, in the line of the former incision when examined at subsequent cæsarean operations.

When infection takes place and the cut surfaces are infiltrated with leucocytes and serum, associated with more or less necrosis, then only that muscle tissue remains which has not become necrotic. Such a scar at operation is from  $\frac{1}{2}$  to 2 cm. broad, white, and depressed. The tissue comprising it may be only serosa and decidua or these may be separated by varying thicknesses of muscle, depending on the extent of destruction or the degree of union which has taken place after the operation. This pathological process may take place in one small area of the wound or may extend throughout. Even in these cases no excess of fibrous tissue is observed in the line of incision; however, in two of the scars examined a small amount of muscle adjacent to the decidua was replaced by fibrous tissue.

Nearly all of the sections examined showed a thickened vascular serosa which occasionally invaded the adjacent myometrium for a short distance. This invasion may have been due to some inversion of the serosa in suturing and in others to a proliferation of the fibrous tissue of the peritoneum. In only one of the twenty cases did the fibrous tissue extend into the muscle to a marked degree, and even then it was not sufficient to weaken the scar.

Again, if the cut surfaces are separated aseptically, due to some mechanical influence, the same picture is presented. In the non-pregnant uterus these surfaces approximate one another, but they are

not firmly united, and when the uterus enlarges during pregnancy they separate, leaving only the muscle tissue that did unite at the upper angle of the wound. This gives the wound a triangular appearance on cross-section, and very often the sides of the triangle are covered with decidua, and if the placenta is situated beneath the wound, villi are also observed.

Of the nine cases of rupture at operation two presented an utero-abdominal fistula, in seven the whole scar was laid open, and in three of these the placenta and foetus were in the peritoneal cavity. A review of the clinical data of these cases shows that only four had fever complicating the operation immediately prior to the rupture, and the time between the last section and the examination varied from one to five years. In four of the seven cases of complete rupture microscopical examination showed that villi were present either in the angle of the old wound or along its edges. Decidua was also observed lining the edges of some of the old scars. In two cases a slight excess of fibrous tissue was observed and this was found on the inner surface between the decidua and the normal muscle. It was in no way connected with the former line of incision.

There was no fat present in the muscle-cells of any of the sections. Inasmuch as fever was present as a complication in only four of the cases, one would conclude that foreign material, either blood or lochia, prevented a firm union of the scar in the other five. The very fact that decidua covered the edges is sufficient to prove that these margins were separated when the patient became pregnant.

Five moderately strong scars were found on examination of the whole scar or margin only. In two of these there was no fever after the previous section; in two the previous history was not obtained, and in one the patient had some temperature. Microscopical examination of one of these scars showed a small area in which the muscle was replaced by a delicate fibrous tissue network, and in another there was more extensive proliferation of fibrous tissue beneath the peritoneum than is usually observed. In four the placenta was attached directly beneath the wound, which shows that the location of the placenta had little effect on the scar, providing there was firm union after the previous operation. There were six cases in this series which presented thin scars varying from the peritoneum only between the edges of the myometrium to different amounts of muscle tissue. Three of these had fever following the preceding operation; an excess of fibrous tissue was not observed in any of them.

The author draws the following conclusions:

1. The strength of the uterine scar after cæsarean section depends upon the absence of infection and foreign material and upon the perfect coaptation of the incised surfaces.

2. A perfectly healed wound leaves the myometrium as strong after operation as before, as far as can be determined by the histological examination of the tissue in the line of the former incision.

3. A continuous suture in the myometrium adjacent to the decidua may assist in preventing the separation of the cut surfaces by blood-clot or lochia in addition to the usual interrupted suture through serosa and myometrium.

4. The placenta in a subsequent pregnancy has little or no effect in weakening the firmly united scar, but if the scar is already weak it may accentuate this weakness.

5. Other than a small amount of fibrous tissue beneath the peritoneum, the myometrium in line with the former incision contains no scar tissue and the uterine muscle regenerates.

6. Rupture invariably takes place through the site of the former scar and not through the adjacent muscle tissue.

7. Without definite means of estimating the strength of the uterine scar after cæsarean section, subsequent pregnancies must always be carefully observed as they approach term.

EDWARD L. CORNELL.

**Ries, E.: The Treatment of Septic Abortion.** *Surg., Gynec. & Obst.*, 1918, xxvi, 400.

Cases of abortion without fever may safely be left to spontaneous termination, the only contra-indication being severe or protracted slight hæmorrhage.

Cases of septic abortion are no exception to this rule. They can terminate spontaneously according to Type 1, in which the abortion takes place spontaneously during the fever and the fever drops after the abortion; or according to Type 2, in which the fever drops under expectant treatment and the abortion takes place subsequent to the fall of the temperature.

In cases of septic abortion, the temperature may be expected to drop under expectant treatment, and if interference becomes necessary, Type 3 of the temperature curve may be observed, no rise of temperature after the operation; or Type 4, a short rise of temperature after the interference followed by rapid and final fall of temperature.

Lastly, severe hæmorrhage necessitating evacuation of the uterus in the presence of sepsis may be followed by immediate and lasting fall of temperature.

If a patient with septic abortion is admitted to the hospital, expectant treatment is followed until the abortion is completed spontaneously. Rectal examination is used exclusively and that as rarely as possible. The patient is kept in bed and on a light diet. If severe or protracted slight hæmorrhage makes interference unavoidable, the uterus is

packed. The packing is removed after twelve to twenty-four hours and frequently the whole remnants of the abortion come away with the packing. If not, the packing has usually dilated the cervix sufficiently so that the uterus can be emptied manually. Repeated packing is not favored as dangerous in itself.

If the uterus is not empty after the removal of the packing, it is emptied preferably by hand, if necessary after additional dilatation with Hegar's dilators; and if the hand is insufficient, with the sharp curette. The longer the interval between the last rise of temperature and the operation, the better. Packing afterward is avoided unless necessitated by severe hæmorrhage. The uterus is never irrigated. Ergot is given only when hæmorrhage exists after complete evacuation of the uterus. Vaginal douches are never given until at least a week after the abortion and then only for subinvolution, not for purulent discharges.

If the temperature is normal after the abortion, the patient is allowed out of bed at any time she feels ready, unless she is very anæmic. The patient is fed well as soon as possible. The patient is discharged three days after the last rise of temperature, unless anæmia, subinvolution, etc., require longer hospital treatment. Rectal examination is repeated before discharge.

EDWARD L. CORNELL.

**Findley, P.: Pernicious Anæmia Complicating Pregnancy.** *Tr. Am. Gynec. Soc.*, Phila., 1918, May.

Findley reports a case of pernicious anæmia complicating pregnancy and raises the question as to whether or not pregnancy should be interrupted in the early phase of pernicious anæmia.

A review of the literature leads very directly to the conclusion that pregnancy and the puerperium favor the development and hasten the course of pernicious anæmia. While pernicious anæmia is not a disease peculiar to pregnancy it is nevertheless true that the disease occurs with unusual frequency in the course of pregnancy and the puerperium. Just what the predisposing factors are in pregnancy is not known. Prolonged lactation, frequent child-bearing, the toxæmias of pregnancy, and unfavorable hygienic surroundings are factors to be reckoned with but are not conclusive. Neither postpartum hæmorrhages nor puerperal infection tend to develop pernicious anæmia, judging from case records. It is of interest to note that with few exceptions pernicious anæmia rarely develops in primiparæ and is more frequently observed in a pregnancy which has been preceded by the birth of several children in rapid succession.

In reviewing the reports of cases, one is struck with the frequency with which it is recorded that the patient was seemingly in perfect health until early in the second semester. As a rule she had borne several children without mishap; there were no evidences of ill health until the sixth or seventh month of gestation when there was observed a rapidly increasing pallor, associated with digestive



disturbances, hæmorrhages from the nose, stomach or bowel, rapidly failing strength, dyspnœa, vertigo, headaches, disturbed vision, palpitation of the heart and eventually œdema of the lower extremities, loss of reflexes, ataxia, rapid pulse-rate and the development of a low grade of temperature.

Such are the clinical and anatomical findings in typical cases, but there is a time in the development of the disease when a positive diagnosis cannot be made. This may be called the incipient stage of pernicious anæmia, a time in the course of the disease when an existing pregnancy may hasten the development of a hopeless condition which without the influences of pregnancy might have been averted. This brings up the question as to whether pernicious anæmia is ever curable.

In every frank case of pernicious anæmia complicating pregnancy the maternal mortality is 100 per cent, although in exceptional cases death may be deferred for a period of weeks, months, or even a year or more following childbirth.

The management of these cases may be said to be in the interest of the mother in the early stages of the disease and of the child in the late stages of the disease. Where the disease is well advanced, the child living and approaching the period of viability, pregnancy should be allowed to proceed to term if possible in the hope of delivering a healthy child. The case of the mother is hopeless and no good could come from sacrificing the child by the interruption of pregnancy.

If the interruption of pregnancy is to accomplish any lasting good, the pregnancy should be terminated in the incipient stage of the disease. It is only in such cases that the author sees any justification for the sacrifice of the child.

**Iyer, A. L. A.: Split Pelvis.** *Madras M. J.*, 1918, i, 35.

The patient, aged twenty-eight years, was admitted to the hospital in labor. She was a para-II and had had a previous abortion. The height of the uterus showed that she was full term. She had strong uterine contractions and the child presented in occipito-dextro-anterior position, with foetal heart beats rather slow.

The lower portion of the anterior abdominal wall was found to be a raw, irregular surface covered by mucous membrane which was evidently the posterior wall of the bladder. The orifices of the ureters could be easily distinguished as urine was constantly dribbling through them. There was no symphysis pubis and there was a gap of about two inches in the middle line between the pubic bones so that the anterior portion of the pelvis was gaping widely. There was no urethra. Just below and behind the raw surface was the orifice of the vagina, which was very narrow and admitted only a finger, through which the scalp could be seen. As there was no union at the symphysis, there was marked flaring of the anterior superior iliac spines like that met with in flat pelvis. External pelvic measurements showed that both intercrystal and inter-

spinous diameters were equal. The external conjugate could not be taken on account of the absence of the symphysis.

Episiotomy was done and the child delivered with slight fundal pressure. Probably the woman would have delivered herself but for the narrow vaginal orifice. The puerperium was uncomplicated.

EDWARD L. CORNELL.

### LABOR AND ITS COMPLICATIONS

**Bernstein, H. A.: The Immediate Operation for Perineal Lacerations.** *J. Am. M. Ass.*, 1918, lxx, 1217.

The mucocutaneous edge of the wound at each side of the tear where it enters the vagina is caught up with a guide and traction suture. The operator or assistant, with regulated tension on these sutures, holds the wound open for inspection. The labia are widely separated, the wound is cleansed, bleeding points are controlled, and the torn edges of the muscles, which are generally represented by depressions in the side walls of the wound, are brought out with tenacula or temporary sutures and joined with chromic catgut, and the number of interrupted sutures are made according to the requirements of the case. Before the muscles are brought together, the cervix may be exposed for inspection and repair.

After the muscles have been replaced, if the wound is deep, slack may be taken up in the connective tissue by one or two buried catgut sutures. With the guide sutures held in position for repair, the edges of the vaginal mucous membrane are now joined with a continuous chromic gut suture, and the outer side of the perineum is repaired with three or four silkworm-gut sutures deeply and widely inserted.

In complete tears, the rectal mucous membrane must be approximated first. The torn ends of the sphincter muscle are then brought out of the wound and firmly secured together, and the operation is completed as above.

It is important in complete tears that a rectal tube be inserted about four inches into the rectum and retained there about four days. The bowels should not be moved during this time and all discharges escaping through the tube should carefully be kept away from the wound and the perineum should be disturbed as little as is compatible with careful cleanliness.

EDWARD L. CORNELL.

**Garcia Parra, I. M.: Spontaneous Rupture of the Uterus During Labor; Uterine Fibroma** (*Ruptura espontanea del utero durante el trabajo del parto; fibroma del utero*). *Gac. méd. de Caracas*, 1918, xxv, 40.

The patient in this case, a multipara aged forty-one years, was brought to the hospital in a moribund condition. Labor had lasted thirty-six hours. A few hours before coming to the hospital she had experienced a sudden acute pain after which she fell into a state of syncope. The labor pains ceased,



some blood issued from the vagina with part of the cord. The attending midwife dragged on this, pulling away the placenta and leaving the foetus to die if not already dead.

The author endeavored to make a manual extraction of the foetus and found a vertex presentation. Passing along the left side in order to perform a version, he suddenly felt a large cavity, the abdominal cavity, and a foot of the foetus was traced in the left hypochondrium. A rapid extraction was made without great difficulty. A large hard tumorous mass was then located in the right side of the abdomen. Examination of this and the antecedents of the case left no doubt that it was the retracted uterus notably increased in volume by a fibroma in the thickness of the walls of the organ.

After extraction of the foetus some intestinal loops herniated into the vagina, but these were replaced and a gauze tampon inserted.

The indications were for a laparotomy but the desperate condition of the patient caused the author to temporize. The woman died two hours later from internal hæmorrhage.

Autopsy showed a rupture in the uterus extending from the lower segment backward through the middle segment to the insertion of the broad ligament and terminating in the neck below, thus occupying almost a complete anterior semicircumference of the organ. The superior segment was filled by a tumor about the size of a large cocoanut. It was clear that the pregnancy had developed in the lower part of the uterus and that its distended wall could not resist and ruptured under the expulsive contractions. It would seem impossible that the pregnancy should have proceeded to term under the circumstances. However, the foetus was normal in size and development.

W. A. BRENNAN.

**Hoag, J. C.: Nitrous Oxide Analgesia in Obstetrics.** *Illinois M. J.*, 1918, xxxiii, 224.

Gas analgesia for six or eight hours is perfectly safe for healthy patients, if properly managed. Gas does not prolong labor, but tends to shorten it and does not lead to physical depression and postpartum hæmorrhage. The prolonged use of chloroform and ether is distinctly dangerous. The author disagrees with those who say that the technique of gas analgesia is so simple that it readily may be entrusted to a nurse or a member of the patient's family. Such a procedure may not be dangerous, but is unproductive of good results. The proper technique can only be learned by very considerable experience, the best results being only obtainable by experts.

Most women who have had gas administered to them have experienced some relief, but not what was their due. Very little oxygen is required and too much of it has been used. In obstetric analgesia the rebreathing bag makes only for a small economy and is, in some respects, objectionable. There is little or no danger of asphyxia to the child, but if it is born asphyxiated, the condition can be re-

lieved by giving oxygen through the mother to the child by the simple expedient of leaving the funis untied until oxygen has been administered freely to the parturient mother.

Internes who make only occasional use of the gas are not satisfactory anæsthetists, and they are, through their unfamiliarity with the proper use of the gas, very wasteful of it and mainly responsible in hospitals for the complaints heard regarding the cost, which is not great under proper control.

EDWARD L. CORNELL.

## PUERPERIUM AND ITS COMPLICATIONS

**McNeile, L. G.: The Effect of Ingestion of Desiccated Placenta During the First Eleven Days of Lactation.** *Am. J. Obst.*, N. Y., 1918, lxxvii, 377.

A preliminary report of the effect of feeding desiccated placenta during the first eleven days of lactation is offered by McNeile, in which he gives a number of detailed tables and reports results. Thirty grains daily of desiccated human placenta were fed to eight of sixteen healthy patients, the diet of all being the same throughout the period of study. The milk was collected from each patient on the third, fifth, seventh, ninth and eleventh days. The babes were weighed at birth and once daily thereafter. The author's conclusions are as follows:

The results do not warrant any definite conclusions. In the cases which were fed desiccated placenta there was apparently some change in the chemical composition of the milk during the first eleven days postpartum. The most marked change was an increase in the percentage of lactose and this was accompanied by a slight increase in the percentage of protein, and a slight decrease in the percentage of fat.

There was no deficiency in the amount of milk in any of the cases receiving desiccated placenta, but the reverse was true in the cases not receiving it.

There was apparently a slight decrease in the initial loss of weight in the infants of mothers receiving the desiccated placenta over those whose mothers did not receive it, and at the end of eleven days the babies whose mothers received the agent were about four ounces heavier than those who did not.

CAREY CULBERTSON.

**Miller, H. A., and Chalfant, S. A.: The Treatment of Puerperal Blood Stream Infection by Means of Arsenobenzol, with Report of Cases.** *Tr. Am. Gynec. Soc.*, Phila., 1918, May.

No form of intravenous medication up to the present time has been entirely satisfactory, although many have been tried. Puerperal bacteraemia has always been a very serious condition with a high mortality.

The treatment as used in these cases was followed up by experimental work by Allison. He found that arsenobenzol, together with similar preparations, could be given frequently in large doses without injury to the animals, that the mortality was less



in treated than in untreated animals, and that the injection of arsenobenzol would usually rid the blood stream of streptococci in twenty-four hours.

He also showed that there was a fall in the leucocyte count before the blood culture again became positive.

The authors have treated eleven cases of puerperal infection by means of arsenobenzol given intravenously, usually in 0.6 gm. doses as frequently as three- or four-day intervals, giving from one to four doses. There were no toxic effects other than a mild albuminuria.

Seven patients had a streptococcus in the blood stream, with two deaths, two a Gram-negative bacillus, with no deaths, and two had a negative blood culture but were both clinically bacteremias and both died.

Two patients had intra-uterine irrigations at two-hour intervals with Dakin's solution; one recovered and one died. In the fatal case autopsy showed the uterus free from infection. Death was due to multiple abscesses of both kidneys.

The following conclusions are drawn:

1. With the use of intravenous injections of arsenobenzol, it has been possible in every instance to rid the blood stream of its invading organism.

2. All varieties of organisms so far encountered seem to be equally influenced.

3. Cultures of localized abscesses are usually identical with cultures from the blood stream. Cultures from the uterus, although this organism predominates, are rarely pure cultures.

4. Reinfections from focal infections may and do occur, but are as readily influenced by arsenobenzol as the original infections.

5. The leucocyte count is usually low in comparison with the temperature and pulse. After arsenobenzol has been given there is a marked increase in the count. If, after this time, there is a decided decrease in the leucocytes with a corresponding improvement in the patient, including the pulse and temperature, it is very possible that the patient has reinfected herself, and arsenobenzol should be given without waiting for confirmation of this culture report.

6. The blood stream is usually found to be sterile in twenty-four hours, always in forty-eight hours, except in one case where but 4 mg. were given.

7. Rabbit experiments by Allison indicate that a dose of 6 mg. is necessary for prompt results.

8. In suspected blood stream infections arsenobenzol may be given immediately after a culture has been taken in order to avoid the delay incident to waiting for a laboratory report.

## MISCELLANEOUS

**Prince, E. M.: Anatomic Defects in the Newborn Demanding Surgical Operation; Report of a Case of Uterine Tumor.** *J. Am. M. Ass.*, 1918, lxx, 1212.

Very young infants withstand surgical shock very well. Ether is the anæsthetic of choice. Respiratory failure is a great danger if gas-oxygen is used. Operations, even of minor nature, on infants without anæsthesia result in pain to such a degree that such a procedure is not justified.

The author reports a case of a child eleven hours old, with a hernia of such size that it contained all the large and small intestines. Ether was used as anæsthetic and the operation performed.

There was also present a cystic tumor of the uterus almost filling the abdominal cavity. This was filled with mucopurulent material. Evacuation of the contents enabled replacement of the intestines and repair of the hernia.

The endometrium was normal. The cervical canal was dilated to prevent recurrence of this condition. Recovery followed operation.

V. E. DUDMAN.

**Heald, C. L.: Artificial Respiration in Asphyxia Neonatorum.** *J. Am. M. Ass.*, 1918, lxx, 1063.

The author presents an instrument made for artificial respiration in infants which has been very satisfactory. It consists of a syringe bulb connected by rubber tubing with an air valve in the dome of a small helmet-shaped mask and by a Y-tube with an ordinary rubber toy balloon. The latter serves as a reservoir, and, as its expansile tension is about 8 mm. of mercury, it prevents the air pressure in the child's lungs from rising above that point. It also produces a uniform, steady flow of air.

After the mouth is cleared out with the gauze-covered finger, a thread on a needle is passed through the tongue to hold that organ well forward, but not outside the mouth. A towel is wrapped snugly but not tightly about the child's abdomen to prevent air from entering the stomach. While an assistant keeps the balloon inflated by compressing the bulb, the operator holds the mask, with its long diameter transversely, over the child's mouth, including the chin but not the nose. With the index finger of the same hand he manipulates the piston of the air valve, pressure on which allows the air to flow. With the finger and thumb of the other hand, he alternately compresses and releases the nostrils through which expiration takes place.

EDWARD L. CORNELL.

# GENITO-URINARY SURGERY

## KIDNEY AND URETER

**Nogues, P.: Kidney Traumatism in Ambulance Service at the Front** (Des traumatismes du rein dans les ambulances de l'avant). *J. d'urolog.*, Par., 1918, vii, 123.

Nogues' report was made at the third reunion of the heads of the Urological Centers of the French Army held at Val-de-Grâce, October 27, 1917.

The two great symptoms in contused wounds of the kidney in war are hæmaturia and perirenal hæmatoma. The first is observed in 95 per cent of the cases. Unless primary hæmaturia is abundant, expectant treatment may be observed.

Hæmatoma when it exists is of equal value with hæmaturia as a symptom. If this has a tendency to constantly increase, it is an indication for immediate operation which may otherwise be deferred. There is however danger of the hæmatoma becoming infected if no operation is done, and there is a second danger of fibrous coating being formed around the kidney which may prevent its functioning and giving rise to a chronic sclerous perinephritis.

In gunshot kidney wounds, with the exception of a few particular cases, there is no reason why the general principles of present war surgery should not be applied, namely, clearing the trajectory, removing foreign bodies, and repairing damage done by the projectile. Nephrectomy is only performed when absolutely necessary, and conservative operations are the rule. The route of approach is usually the lumbar for an isolated kidney wound, and a median or lateral laparotomy is done when there are concomitant lesions.

Generally an immediate operation on the kidney or ureter is only indicated when there is an important hæmatoma or abundant hæmaturia. Discharge of urine through the wound does not of itself justify a nephrectomy.

W. A. BRENNAN.

**Grulee, C. G.: Diagnosis and Treatment of Pyelocystitis in Infancy.** *Northwest Med.*, 1918, xvii, 82.

To the majority of general practitioners pyelocystitis in infancy is almost an unknown condition. Probably the chief reason that this condition is not recognized more frequently is that the symptoms as a rule do not point to the urinary tract. The onset is usually sudden with high rise of temperature and little else. Urination is not noticed to be more frequent nor is the urine irritating. In fact, the chief characteristic aside from high fever is almost entire absence of physical findings. This is so marked that it alone should lead one to think immediately of urinary infection.

Following the onset with sudden rise of tempera-

ture, the fever continues usually quite irregularly. Various types may be mentioned. There is in some instances the high continuous type of temperature, ranging from 104° to 106°, never dropping. This may lead in a few days to death. Grulee describes the physical findings which occasionally may be noted.

Naturally the examination of the urine is of greatest import. In the early stages Grulee found no pus cells but a distinct bacilluria. Within twenty-four to seventy-two hours pus makes its appearance. Red blood-cells and albumin are also found. Bacteriologically the colon bacillus is the most frequent causative factor; occasionally streptococci and staphylococci. Grulee warns against looking upon this condition of pyelocystitis lightly. The differential diagnosis is considered.

To effectively treat the disorder, the infective organism should be recognized. The colon bacillus, the common offender, does not grow well in alkaline media. Therefore large quantities of alkalies should be administered. To a young baby under six months one may give ten grains of soda bicarbonate and ten grains of potassium citrate every two hours, to be continued night and day. This treatment is continued from four days to a week. After improvement sets in hexamethylamine is given, three to five grains six times daily. During the first twenty-four hours acid sodium phosphate is given to acidify the urine. The urine is tested for formalin. Occasionally it will be found that one will not get results with the urotropin; in that case salol should be tried.

Autogenous vaccines have been repeatedly tried by the author but without results.

H. W. E. WALTHER.

**Peterson, A.: The Effect on the Kidney of Ureterovesical Anastomosis; Experimental and Clinical Report.** *Tr. Am. M. Ass.*, Sect. G.-U. Dis., Chicago, 1918, June.

Experiments were conducted and observations were made for the purpose of evolving a technique for the implantation of the ureter into the bladder, and to study the effect of such an operation on the kidney and the ureter. Unilateral implantations were done on 18 dogs and bilateral implantations on 3, giving a total of 24 observations. Four methods of implantation were used.

The Coffey technique consists of splitting the serous and muscular coats for three-fourths of an inch, and entering the lumen of the bowel through a small stab wound in the mucosa. The ureter is pulled well into the lumen by means of an anchoring suture placed through the split end of the ureter and tied three-fourths of an inch below its entrance. The serous and muscular coats are then approxi-



mated around the ureter, and one stay suture is placed one-fourth of an inch above the anastomosis.

The Stiles technique consists of entering the lumen of the bowel through a stab wound and approximating the intestinal wall without further dissections over the ureter; the wall of the ureter is also caught in these sutures. The Coffey and Stiles methods were used, with slight modifications, in the work in this series.

The Furniss technique consists of penetrating a double fold of the wall of the bladder with an artery forceps and pulling the severed ureter through both openings made by the forceps. The ureter is secured to the wall of the bladder by a few interrupted sutures at its lower entrance into the bladder, and the end is permitted to hang free in the cavity of the bladder. The anterior opening is then closed.

A technique suggested by Mann of the Division of Experimental Surgery and Pathology of the Mayo Clinic was used in a few of the experiments. Two parallel incisions one-fourth of an inch in length and one-half an inch apart are made at right angles to the long axis of the bladder, extending down to the mucosa. This seromuscular bridge is undermined leaving the mucosa intact. A small stab wound is made through the mucosa, at the site of the lower transverse incision. The severed ureter, having been split one-fourth of an inch on its anterior surface, is pulled beneath the bridge from above downward and anchored to the inner surface of the wall of the bladder, one-fourth of an inch below the opening. One or two interrupted bridges are made on each side of the ureter, approximating the transverse incision up to the ureter.

Observations of the end-results were made from one day to five and one-third months following the implantations. There were entirely normal kidneys and ureters in 15 instances; slight hydronephrosis in 2; marked hydronephrosis in 1; miliary abscesses of the kidney in 1; pyonephrosis in 1; normal kidney and hypertrophied ureter in 2; and the ureter pulled out in 2. Fifteen implantations, or 62.5 per cent, were complete successes. Normally functioning kidneys were found in 19, or 80 per cent. There was complete failure from stenosis, infection, and the pulling out of the ureters in five cases, or 20 per cent.

In 21 cases in the Mayo Clinic the ureter has been implanted into the bladder and the effect on the kidney has been studied. Fifteen patients had extensive resections for tumor of the bladder and implantation of one ureter. Four had uretero-vaginal fistula; in one the right ureter opened into the urethra, and in one the left opened into a diverticulum. Seventeen of the 21 patients were cystoscoped from eighteen days to four and one-half years after operation. In 9 cases, or 53 per cent, of the 17 patients the function of the kidney was entirely normal. Fair function was found in 3 cases, or 18 per cent, and functionless kidneys in 5 cases, or 30 per cent. Four patients died from the

fourth day to the second month after the operation; 2 showed slight dilatation of the implanted side; in 1 the pelvis was markedly dilated and in one there was no evidence of obstruction.

The author's conclusions are as follows:

1. From the experimental and clinical observations it is obvious that a normal or nearly normal kidney and ureter should result following the implantation of the ureter into the bladder.
2. The utmost care to minimize the operative trauma must be observed.
3. The placing of a forceps over the end of the ureter should be avoided.
4. No suture should enter the wall or lumen of the ureter other than the anchoring suture placed at the split extremity of the ureter, and the approximation of the wall of the bladder must be accomplished without undue compression.
5. When marked dilatation of the ureter has occurred prior to surgical interference, and when it is necessary to implant the ureter under tension, a successful result is very doubtful, and ligation is preferable to any effort of implantation.

#### BLADDER, URETHRA, AND PENIS

**Jack, H. P.: A New Technique for Bladder Drainage.**  
*J. Am. M. Ass.*, 1918, lxx, 1225.

Jack uses the Murphy button in bladder drainage in a manner similar to its use in intestinal anastomosis and enterostomy. One half of the button is inserted in a large rubber tube; the other half may first be surrounded down to its shank by a soft rubber ring so that it will not cut through too quickly, and placed inside the bladder through a small slit. A close approximation of the bladder tissues is made about its shank. There is now a perfect joint, and drainage may be used as much or as little as desired.

A small catheter may be placed through the button fastened in the bladder in order to insure good drainage of cavities that may be present.

The operation is done under local anæsthesia and followed in forty-eight hours by bladder irrigations every four hours. The tube may be clamped and the patient up and about if permitted.

In ten cases of prostatectomy Jack used this method with excellent results. No infections of the space of Retzius occurred. The bladder incision may be made of sufficient length to allow the search for and removal of stones; at the same time a non-leakable joint is secured by a purse-string suture which brings the edges of the bladder in close contact to the button.

HARRY CULVER.

**Sutton, R. L.: Subcutaneous Injections of Oxygen in the Treatment of Balanitis Gangrænosa.**  
*J. Am. M. Ass.*, 1918, lxx, 675.

Gangrenous balanitis, though a rare disease, is a very serious infection caused by a symbiosis of the fusiform bacillus and Vincent's spirillum, both strictly anaerobic organisms.

The lesions are usually single and do not produce bubo. The local infection, usually virulent, has a peculiar characteristic odor and results in early phimosis and often severe constitutional symptoms.

Arsenic as a spirochæticide holds first place, while locally oxygen-bearing preparations are used.

A case is reported in detail which did not respond to such local agents as hydrogen peroxide and moist packs for thirty-six hours; therefore subcutaneous injections of pure oxygen by means of a hypodermic needle attached to an oxygen tank were given at four-hour intervals. Within six hours the progress of the disease was checked and in twelve hours was completely under control. Recovery with slough was uneventful.

HARRY CULVER.

### GENITAL ORGANS

**Cook, R. L.: The Surgical Treatment of Epididymitis.** *J. Am. M. Ass.*, 1918, lxx, 981.

Cook's results with the surgical treatment of gonorrhœal epididymitis have been so uniformly good that he recommends this treatment in all cases. He has operated upon 276 patients at Fort Sam Houston and their average time in the hospital has been ten days, often being put back on duty the same day on which the stitches are removed, i.e., the sixth or seventh day.

The pain is relieved at once but induration remains which does not incapacitate if a suspensory bandage is worn for several weeks.

Thirty-three per cent of his cases presented pus at operation, the removal of which he reasons will result in a better functioning organ than if it were absorbed. At the same time hydrocele is cured, which is often present.

The technique of Cook's operation varies from the usual bottle operation for hydrocele only in that the globus minor is punctured several times with a cataract knife and if pus is found a small rubber tissue drain is inserted. The skin is closed with two mattress sutures taken about one-fourth of an inch from the cut edges and pulled up tight.

Drains are removed in forty-eight hours and skin sutures in six days.

HARRY CULVER.

**Luys, G.: Boring Through the Prostate in the Treatment of Hypertrophy** (Le forage de la prostate dans le traitement de l'hypertrophie de la prostate). *Bull. Acad. de méd.*, Par., 1918, lxxix, 141.

In treating prostatic hypertrophy Luys tunnels through the obstacles which hinder the free course

of the urine. This is done through the natural passage under direct visual inspection, whether the obstacle is a prostatic bar or a consolidation of the two hypertrophied prostatic lobes.

The destruction of the obstacle is made through the author's direct vision cystoscope, and by using this it is possible to comply with the two essentials of this treatment:

1. Destruction by fire of the urethral portions of the prostatic adenoma in air and not in water, as the aspiration by means of this special cystoscope prevents accumulation of urine in the field of operation; it also allows a good view.

2. The inclined position of the patient allows a perfect differentiation of what belongs to the neck of the bladder, to the bladder, or to the prostate.

The prostatic obstruction is cut through vertically by the galvanocautery under direct vision. A V-section is then burned out, the apex being below so that a regular trench is formed. The second part of the work consists in scooping out or excavating through the lateral lobes. A regular tunnel is formed by degrees which extends from the bladder neck to the verumontanum. When this is sufficiently formed so that the cystoscopic tube glides without any difficulty through the whole prostatic urethra, the patient will not only urinate easily, but will completely empty the bladder.

The operation should not be done all at once, but it is preferable to do it in several stages separated by an interval of about a week. Three to six sittings will suffice.

There may be perhaps some bleeding from the action of the galvanocautery, but electrocoagulation will immediately arrest it.

This tunneling of the prostate finds its application in a considerable number of cases where the prostate is not very large and where prostatectomy as performed at the present time is out of proportion to the symptoms observed. The operation is not dangerous and does not need either a general anæsthetic or hospitalization. It can be done in patients with renal insufficiency. Its results are not only immediate but also permanent. One of the author's patients operated upon more than four years has been re-examined and his condition continues to be perfectly satisfactory; retention has never recurred. Two capital effects are noted after the operation, namely, complete disappearance of the vesical residue, and the force of the expelled jet.

Thirty cases treated up to the time of this report have given most encouraging results.

W. A. BRENNAN.



# SURGERY OF THE EYE AND EAR

## EYE

**Duverger:** Resection of the Anterior Segment as an Operation of Urgency in War Wounds of the Ocular Globe (La résection du segment antérieur comme traitement d'urgence des plaies du guerre du globe). *Arch. d'ophth.*, Par., 1917, xxxv, 705.

In most cases of severe eye injuries in war, enucleation is called for; but the operation gives a double loss; there is not only the loss of vision but there is also a deformity which prosthesis only incompletely hides. In many cases, however, the ocular globe is not entirely destroyed and the lesions are confined to the anterior segment. In such cases the author follows the rule of conduct applied to other orbital regions: immediate operation, the resection of all damaged tissues until healthy tissue is reached, the preservation of all that can be saved; and primary suture. This comprises resection of the anterior segment.

In 150 penetrating wounds of the ocular globe this operation has been carried out in 24 cases. These 24 operations done within the first forty-eight hours after injury have in every case given immediately perfect results with operative recovery in from eight to twelve days without pain and with an excellent stump. It should therefore be substituted whenever possible for enucleation or exenteration.

With regard to the possible future complications on the score of sympathetic ophthalmia, the author thinks that until there is proof to the contrary there is infinitely less susceptibility to sympathetic complications than in the case of the more extensive operations. Future experience alone will give definite indications in this regard. W. A. BRENNAN.

**Crisp, W. H.:** The History of the Operation for Cataract. *Ann. Ophthalm.*, 1917, xxvi, 585.

Vague records of surgical procedures for relief of blindness due to cataract are found in the earliest written accounts of civilization.

The word cataract was used as loosely among the ancients as among the laity of the twentieth century and meant a change in the appearance of the pupil with blindness; this is not strange considering that hardly a half century has elapsed since the discovery of the principle of the ophthalmoscope.

Probably for several thousand years the only operation performed for cataract was couching, and evidence points to its being first performed by the ancient Indians. The Arabs of the middle ages describe two methods of couching, one that of the Greeks in which the lens was depressed by means of a sharp needle thrust into the eye, and a second in which a blunt needle was introduced through an opening made in the sclera with a knife.

The native operators in India now are itinerants known as Vydians, and it is considered probable that over forty per cent of the eyes on which couching is done by them are lost by sepsis. While their work is now forbidden by the British Government, it should be recognized that for centuries countless numbers have owed their vision to the operations of native workers and the procedure is referred to as one of the greatest achievements of ancient surgery.

For at least two thousand years it was believed that cataract consisted in something placed before the lens and it was not until 1682 that it was demonstrated by dissection that the opacity was in the lens itself.

The modern method of cataract extraction was established by Daviel in 1745 and was done without anæsthesia. The operation as performed today is essentially that devised by him a hundred and seventy years ago. S. S. HOWE.

**Spencer, F. R.:** The rôle of the Ductless Glands in Ophthalmology. *Colorado Med.*, 1918, xv, 41.

Because ductless gland disorders are often seen first by the oculist owing to headaches or predominating eye symptoms, the author urges more consideration of the subject by ophthalmologists and discusses the glands in their relation to the eye.

Referable to the thyroid, twenty symptoms are described, the majority of which are explainable by stimulation of the sympathetic.

Insufficiency of the parathyroids is held responsible for zonular cataract, convulsions of childhood, tetany, eclampsia, and epilepsy.

Eye symptoms due to the pineal and pituitary glands are those of pressure caused by hyperplasia, and in pituitary derangement contraction of the visual fields and homonymous hemianopsia occur early.

Thymus hypersecretion produces the opposite effects from the thyroid, contracted pupils, narrow palpebral apertures, etc., resulting. Thymus feeding with radium and X-ray treatment remarkably improved patients who had not been benefited by thyroidectomy for exophthalmic goiter.

The adrenals produce their effect on the eye by stimulation of other glands and the sympathetic.

Three cases with eye symptoms referable to the ductless glands are cited. S. S. HOWE.

**Green, A. S., and Green, L. D.:** Dakin's Dichloramine-T Solution for Ocular Infections. *J. Am. M. Ass.*, 1918, lxx, 1212.

The authors report four cases of protracted conjunctivitis in which a rapid recovery followed the use of Dakin's solution, 0.5 per cent strength, in oil.

They call attention to the great difficulty in finding a germicide which is effective without injuring the tissues. Their experience with Dakin's solution encourages them to experiment with stronger solutions.

EMORY HILL.

## EAR

**Heitger, J. D.: The Application and Interpretation of the Newer Ear Tests.** *J. Indiana St. M. Ass.*, 1918, xi, 135.

After a short historical introduction, the author gives the technique as worked out by Jones and his associates.

Speaking of the interpretation of the tests, the author mentions the following data as suggestive of a peripheral lesion:

1. A proportionate impairment of the function of the cochlea and kinetic-static labyrinth.
2. History or presence of tinnitus.
3. Proportionate impairment of the responses from the vertical canals and from the horizontal canals.
4. A proportionate impairment of nystagmus and vertigo.

On the other hand, the following suggest a central lesion:

1. Normal cochlea with impaired or non-responsive canals.
2. Normal responses from the horizontal canal, but impaired responses from the vertical canals, or vice versa.
3. Normal nystagmus but impaired vertigo from the horizontal canal, or vice versa.
4. Normal nystagmus, but impaired vertigo from the vertical canals, or vice versa.
5. Normal nystagmus and vertigo from any semi-circular canal but (a) impaired past pointing in any direction of any extremity, or (b) impaired or absent normal falling.
6. Spontaneous vertical nystagmus.
7. Non-responsive semi-circular canals of one side and a nystagmus to that side.
8. The production of conjugate deviation of the eyes instead of nystagmus.

OTTO M. ROTT.

**Black, W. D.: Indications for the Radical Mastoid Operation in Chronic Suppurative Otitis.** *J. Missouri St. M. Ass.*, 1918, xv, 121.

The author divides the indications for the radical mastoid operation into two classes: the indications for immediate operation, and the indications for a deferred operation.

The immediate operation is done to save life in such cases as present severe and dangerous complications, such as otitic brain abscess, epidural abscess, cerebellar abscess, thrombosis of the lateral sinus, extensive cholesteatomata, beginning

symptoms of meningitis of otitic origin, sudden facial paralysis, labyrinthitis, or labyrinthine irritation.

The deferred operation is indicated for the relief of symptoms such as a discharge which resists the more conservative procedures for two or three months; gradual reduction in the hearing when hearing in the other ear is good; pain in the ear, over the mastoid or over the side of the head; headache, particularly if it is less when the discharge increases; fever and malaise; vertigo; where life insurance is desired.

OTTO M. ROTT.

**Lyon-Mercado, M.: A Note on the After-Treatment of the Radical Mastoid Operation.** *Lancet*, Lond., 1918, cxciv, 373.

The author gives the results of a series of 25 operations performed within the last year.

The subjective symptoms and objective indications of the 25 cases are tabulated as follows:

1. Fetid discharges varying from over one to six years' duration, in 10 cases.
2. Purulent discharges of two years' standing, with symptoms of headache, vomiting, vertigo, and optic neuritis, in 2 cases.
3. Fistulous opening into the mastoid with cholesteatoma, 1 case; with cholesteatoma alone, 4 cases.

4. Tuberculous disease of the mastoid (a) with facial paralysis of five months' duration before operation; and (b) with no facial paralysis, in 2 cases.

5. Existing middle-ear disease with lateral sinus phlebitis and thrombus in lateral sinus, 2 cases.

6. Fetid discharge of two years' standing with (a) single polypi; and (b) multiple polypi, 4 cases.

The posterior operative wound, except in the lateral sinus cases, was closed at the time of operation and healed by first intention. Unless there was oedema, intense pain, or a rise in temperature, there was no need to dress the cases until the fifth morning. The mastoid antrum was syringed through the external conchameatal opening, made expressly for drainage, with 3 ounces of hydrogen peroxide diluted one-half, or fresh eusol in half strength. The mastoid antrum was then cleaned out with two strips of ribbon-gauze soaked in a solution of picric acid,  $\frac{1}{2}$  per cent, in methylated spirit,  $7\frac{1}{2}$  per cent. The ribbon-gauze varied from six to ten inches in length. A third strip of ribbon-gauze soaked in the same solution was lightly packed into and left in the mastoid antrum until the next dressing.

After the first dressing alternate day dressings only are required. The amount of packing left in the mastoid antrum is lessened as it begins to heal over. About the fourth week the packing is discontinued, the ear being merely syringed.

OTTO M. ROTT.



# SURGERY OF THE NOSE, THROAT, AND MOUTH

## NOSE

**Baum, H. L.: Two Cases of Nasopharyngeal Polypus Originating in the Maxillary Sinus.** *Laryngoscope*, 1918, xxviii, 180.

In the first case, the antrum was entered through the canine fossa and the cavity found filled with a cystic polyp which had its attachment on the nasal wall of the antrum. The nasopharyngeal portion was firm and fibrous, a fibromyxoma. The antral portion was cystic. The junction of the two portions was fibrous. Histologically the nasal portion showed stratified squamous epithelium, this change showing that disease and pressure had modified the epithelial type from the columnar to the squamous form.

Similar changes occurred in the second case.

Otto M. Rott.

**Veyrassat: Nasal Prosthetics by Tibial Bone Graft** (A propos d'une mutilation du nez par balle explosive traitée par la prothèse osseuse tibiale). *Rev. méd. de la Suisse Rom.*, 1917, xxxvii, 754.

Veyrassat got an excellent result by a tibial bone graft in a nasal deformity due to gunshot injury. The conditions which he considers necessary to success in a case of bone graft are: (1) absolute asepsis; (2) absence of hæmorrhage; hæmostasis must be assured in order to avoid postoperative hæmatomata and the shedding of the graft; (3) preservation of the periosteum in a bone graft; (4) rapidity of application of the graft after its removal.

He thinks that in the case of the nose, when grafts are applied by the submucous route they often give rise to hæmorrhages which are difficult to control; hence unless contra-indicated for essential reasons, the external method is better. He also prefers a general anæsthetic because local infiltrations of novocaine or cocaine are liable to compromise the vitality of the tissue in the vicinity.

W. A. BRENNAN.

## THROAT

**Dean, L. W., and Gregg, J. B.: An Implantation Cyst of the Larynx.** *Laryngoscope*, 1918, xxviii, 74.

The author reports a case of implantation cyst of the larynx which occurred in a patient who had previously been treated for tuberculous laryngitis and states that no other case of this laryngeal tumor appears in the literature. After defining implantation cysts, discussing their presence in the skin, cornea and iris, and referring to the other types of laryngeal cysts, he concludes that in laryngeal tumors following operative procedure, especially

when not accompanied by evidence of inflammation, the diagnosis of implantation cyst must be considered.

H. H. FREILICH.

## MOUTH

**New, G. B.: The Use of Heat and Radium in the Treatment of Cancer of the Jaws and Cheeks.** *Tr. Am. M. Ass.*, Sect. Stomatol., Chicago, 1918, June.

The author reports the results of the treatment in the Mayo Clinic during 1917 of 21 patients with cancer of the jaw and cheek without glandular involvement. The method of treatment consists of the thorough cauterization of the growth with slow heat for from twenty to forty-five minutes. A soldering iron and a water-cooled retractor are the most satisfactory means of cauterization. This is followed by radium treatment.

It is essential that the patients be seen once a month after the treatment so that if there is any recurrence they may have immediate care. Of the 21 patients treated, 20 were traced; of these 14 have been free from local recurrence for from six to eighteen months. One patient who was recaptured three months previously thus far has no recurrence. One died of lymphatic leukæmia six months after operation; there was no recurrence. Two of the 14 patients developed glands of the neck and have had block dissections done. Thus 12 of the 20 patients have had no recurrence locally or in the glands of the neck for from six to eighteen months. One patient, who had been operated upon before coming to the Clinic, had a hopeless local recurrence. Two patients died of the cancer; one had been operated upon before coming to the Clinic; one consulted a plaster doctor, and his condition cannot be learned. There was no operative mortality.

This group of cases shows that the immediate results in the treatment of epithelioma of the jaws and cheeks without glandular involvement, by the use of the cautery and radium, have been very encouraging. The end-results cannot be foreseen but it is believed that by the addition of radium to the treatment much more is being accomplished than formerly.

**Shearer, W. L.: A Few Principles of Harelip and Cleft Palate Procedure.** *Med. Herald*, 1918, xxxvii, 79.

Shearer recommends the Brophy operation in patients having a cleft of the palate, alveolar process, and lip. In the first operation, he recommends closing the alveolar cleft by lead plates fitted against the buccal surfaces of the arch. Silver wires are passed through the molar bone just under

the floor of the orbit on either side. These wires also pass through the lead plates and then are twisted so as to bring the borders of the cleft together.

After this is accomplished, the mucosa is dissected from the bone so that the bone tissue will unite. In the next operation the lip is closed and in the third operation he closes the cleft of the soft palate.

To accomplish the best results, Shearer recommends that the first operation should be done from the ages of ten days to six or eight weeks, and that the lip and soft palate should not be considered until there is bone union. M. N. FEDERSPIEL.

**Blum, T.: Mouth Surgery, with Special Reference to Cysts of the Jaws.** *Med. Rec.*, 1918, xciii, 634.

Attention is called to the importance of making diagnoses of various pathological conditions involving the jaws. Blum claims that a large number of cases of apical infections can be cleared up without tooth extraction. This is done by root amputation, consisting of the removal of the apex of the tooth and curettage of the apical area by an incision made through the gum tissue. Blum also states that most of the bone infections of the jaws are caused by diseased teeth. He speaks of the need of recognizing radicular cysts, follicular cysts, odontoma, unerupted wisdom teeth, and ranula.

M. N. FEDERSPIEL.

**Churchman, J. W.: Fibroma of the Tongue with Consideration of Other Tumors of the Tongue and Certain Technical Points in Tongue Resection.** *Med. & Surg.*, 1918, ii, 173.

The average surgeon classifies tumors of the tongue as either benign, fibroma or cyst, granuloma, tuberculous or syphilitic, or carcinoma. The following new-growths have been reported in the last twenty years:

1. Benign tumors: papilloma, lipoma, leiomyoma, fibroma, tumors of an aberrant thyroid gland; chondroma, osteoma, plasmoma, angioma; cysts, congenital, thyrolingual, dermoid, degenerative, hydatid.

2. Malignant tumors: epithelioma, sarcoma, endothelioma, lymphangioma, amyloid tumor. Fibroma of the tongue is very rare and when present may resemble a cyst. Diagnosis is only possible microscopically.

Sarcoma is also rare. Aids in diagnosis are the occurrence, equally frequent in both sexes; the over-

lying epithelium is unbroken; there is no gland involvement. It is the author's opinion that in these cases the simple removal of a wedge-shaped section of the tongue gives as good a prognosis as a more radical resection. In the case reported by the author this was done and convalescence was uneventful and a perfectly functioning tongue resulted.

As regards the technique of operations on the tongue, the inside of the mouth is never touched by knife. Entire resection is done with a cautery. Hæmorrhage is further controlled by silk stay sutures placed in the tongue posteriorly to the resection. The author does the hemi-resection. The operation is done by first removing the glands of both sides of the neck, and two or three weeks later the tongue resection is done by the jaw-splitting operation. To prevent a persistent sinus of the jaw the author prefers wiring the teeth rather than the fragments.

I. E. BISHKOW.

**Thoma, K. H.: The Histological Pathology of Alveolar Abscesses and Diseased Root-Ends.** *Dental Cosmos*, 1918, lx, 13.

In a histopathological study of alveolar abscesses and diseased root-ends, Thoma describes the tissue changes which take place at root-ends. The alveolar abscesses caused by diseases of the dental pulp involve two distinct chains of pathological processes. The first is spoken of as the acute alveolar abscess, a process of destruction; the second is of a constructive nature called a granuloma. The acute condition usually terminates in the formation of granulation tissue and is nature's attempt at healing.

The dental granuloma is placed between pure inflammation and neoplasm. Microscopically, it is a distinct chronic inflammation usually found at root-ends, increasing at the expense of the surrounding bone.

If there are epithelial cells at the points of irritation due to the chronic inflammatory condition, a proliferation occurs and dividing and branching chains of epithelial cells will be found which grow like a net-work through the lesion, a frequent forerunner of cyst formation.

Alveolar abscesses also tend to produce root-end necrosis. In many cases there is a tendency for the fibers and cells of the peridental membrane to have a wonderful resistance to disease. This may result in the formation, layer upon layer, of a new cementum which causes an enlargement of the root-end.

M. N. FEDERSPIEL.



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## SURGERY OF THE EXTREMITIES

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# INTERNATIONAL ABSTRACT OF SURGERY

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## COLLECTIVE REVIEW

### GAS GANGRENE

By ABRAHAM O. WILENSKY, M.D., NEW YORK

The following synonyms for gas gangrene have been used by different authors: molecular gangrene; traumatic emphysema; acute putrid infection; acute gangrenous septicæmia; spreading traumatic gangrene; emphysematous gangrene; acute gangrenous œdema; serous gangrenous infiltration; primary mephitic gangrene; progressive gangrenous emphysema; gas phlegmon; acute microbic or bacillary gangrene; fulminating (foudroyante) gangrene; gangrenous cellulitis; malignant œdema; anaerobic gangrene; war gangrene; erysipele bronzé (Velpeau).

**I**NFECTIONS of the human body, characterized by the production of gas in the tissues both before and after death, have been known for a long time. The first classical descriptions of this disease were made by Maisonneuve in 1852 and by Pirogoff in 1864 and resulted directly from an abundant experience gained in the treatment of wounds during the European wars of the middle half of the last century. Injuries due to firearms or other causes, with the similar complication of gas production, had also been noted in civil life. "Foamy" organs have also been seen from time to time in the autopsy room; these resulted from general infections and might occur in a postabortive or postpartum period, or might find their origin in any of the other body systems, such as the gastro-intestinal or genito-urinary tracts.

Special attention has always been directed toward gas infections which have complicated civil or military injuries, the first from the rather dramatic sequence of events, the second from the large numbers of wounded in whom gas appeared in the wound, and in both, because of the large number of fatal results. The explanation in prebacteriological days was rather crude

and it was assumed that the gas resulted from the reaction of the atmospheric air with decomposing tissues, especially fat and bone-marrow, which had resulted from severe trauma.

The cause for the gas production was finally discovered by Welch, in 1891, to be bacterial and full descriptions of his discovery were reported by Welch and Nuttall in 1892. Abroad the first report was made by Fraenkel, and his very valuable monograph written in 1893 deals with the subject of gas phlegmons. The etiological cause was described as a bacillus called by Welch the bacillus aerogenes capsulatus, and by Fraenkel the bacillus phlegmonis emphysematosæ.

#### BACTERIOLOGY

In all of the reported cases this bacillus is found to be growing in symbiosis with other bacteria; and from time to time reports have appeared in which one of these other organisms have occurred in a gas infection in which the Welch bacillus was not found. It is most generally believed, however, that the other organisms are relatively subsidiary and the consensus of opinion makes the bacillus aerogenes capsulatus the chief offender.

The actual bacterial flora in traumatic wounds with a complicating gas infection is constantly similar, and the organisms found nearly always include the following: bacillus aerogenes capsulatus, bacillus of malignant œdema, bacillus proteus vulgaris, bacillus pseudo-œdematis maligni, bacillus coli communis, staphylococcus, and streptococcus. The frequency with which the various organisms are found in cases of gas gangrene was lately determined by Ivens in a



series of 107 wounded soldiers to be as follows: bacillus perfringens was found in nearly every case; bacillus sporogenes in 41 cases; vibron septique in 6 cases; streptococcus in 59 cases; tetanus bacillus in 15 cases; bacillus histolyticus, bacillus Hibler IX, and bacillus œdematiens less frequently.

The relative frequency with which anaerobic bacteria are found in cases of gas gangrene was determined by Weinberg and Seguin in a series of 91 cases. The following percentages were found: bacillus perfringens, 77 per cent; bacillus œdematiens, 34 per cent; bacillus sporogenes, 27 per cent; bacillus fallax, 16.5 per cent; vibron septique, 13 per cent; bacillus histolyticus, 9 per cent; bacillus aerofœtidus, 5.5 per cent; bacillus putrificus, 2 per cent; bacillus bifermentis, 2 per cent; bacillus Ghon-Sachs II, 1 per cent; bacillus tertius, 1 per cent; bacillus tetanus, 10 per cent.

*Bacillus aerogenes capsulatus* (bacillus phlegmonis emphysematosæ of Fraenkel; bacillus enteridis sporogenes of Klein; bacillus perfringens of Veillon) has a wide distribution in nature and is found in the soil, dust, brackish water, and in the normal intestinal tracts of humans and animals. The organisms are large, non-motile, Gram-positive bacilli inconstantly showing spores. Capsules can be demonstrated in organisms taken directly from animal tissues. In animals dying with this infection, the body becomes enormously distended with gas, which, on being liberated and ignited, burns with a pale blue flame.

*Bacillus œdematis maligni* (vibron septique of Pasteur) was shown by Gaffky and others to be also widely distributed in nature and in the intestines of humans and animals. The organisms are long, motile, Gram-negative rods with spores; the latter are very resistant.

*Bacillus proteus vulgaris*. Organisms of the proteus group are very frequently encountered in routine bacteriological work and show superficial similarities to organisms of the colony-typhoid group. They are slightly pathogenic and in man are found in conjunction with other bacteria.

*Bacillus tetani*. This organism is a long slender rod which grows anaerobically and whose spores are very resistant. The spores are found with special frequency in highly cultivated and manured fields (the present fighting grounds).

*Bacillus sporogenes* (bacillus cadaveris sporogenes of Metchnikoff). This is a long slender bacillus which resembles the vibron septique. It is characterized by producing a putrid destruction of tissues by the aid of a proteolytic ferment which it secretes.

*Bacillus œdematiens*. This is a strain of the perfringens organism, described by Weinberg and Seguin, which is characterized by an extraordinary toxicity and extensive œdematous infiltrations, which resembles very much a "white" erysipelas. The organism is difficult to isolate. Other strains are the bacillus bellonensis of Sacquépée, the bacillus sarcoemphysematodes hominis of Conradi and Bieling, and the "gasodembazillus" of Aschoff.

*Bacillus fallax*. This organism has only lately been described by Weinberg and Seguin. It combines the morphology of the vibron septique, the faculty of producing extensive œdema of the œdematiens bacillus and the gas-producing properties of the perfringens organisms.

*Bacillus histolyticus* is a variety of the perfringens bacillus and causes necrosis of tissues. It is morphologically identical with the Welch bacillus, but produces no gas in the cultures.

*Bacillus Hibler IX* is a strain of the Fraenkel bacillus.

*Bacillus Ghon-Sachs II* is either identical, or closely allied, with the bacillus of malignant œdema. All the other organisms mentioned, with the exception of bacillus coli communis, the streptococcus and the staphylococcus, are anaerobic, are very commonly encountered in the intestinal contents, and develop toxins which have a mild pathogenicity. Bacillus coli communis, streptococci and staphylococci need no special description.

Douglas, Fleming and Colebrook interpret their bacteriological findings thus: It appears that the primary infection is fœcal and the bacterial content of the wound includes anaerobes, perfringens bacilli and putrefactive organisms, streptococci, bacillus proteus and diphtheroids. As the wound progresses, the anaerobes gradually disappear and leave behind streptococci, staphylococci, diphtheroids and occasionally bacillus proteus. In the early stages of the wound bacillus perfringens, bacillus œdematis maligni and streptococci make most of the trouble; in the later stages, streptococci are responsible for all serious complications.

#### PATHOLOGY

The wounds in which gas infection commonly develops are large and are marked by extensive destruction. The character of the wound may be immediately visible; or the affected limb may bear a comparatively small and apparently insignificant wound which on exploration reveals a very much larger subcutaneous injury. The path or paths of the single bullet, or of the multiple

shell fragments, are lined by pulpified soft tissues and comminuted bone, and form irregular ramifying pockets which are deep and tortuous. The most inaccessible of these constantly harbor various foreign bodies,—fragments of devitalized bone, bullets, fragments of shell or shrapnel, splinters of wood, dirt, torn-off pieces of clothing, the latter frequently contaminated with faecal matter. Always the wound extends into muscle, and so constant is this finding that the opinion has been frequently expressed (Wallace, McNee and Dunn, and others) that gas gangrene will not occur in the absence of muscle injury. Hæmatoma formation varies from numerous small collections to large masses which infiltrate in all directions and effectively hide the source of the bleeding. Macroscopic blood-vessel injury is common and frequently the main artery of the limb is torn and the resulting gangrene prepares the way for a massive gas infection. The surfaces of the wound are ground thoroughly full of dirt; the odor is foul; and the discharge is thin and sanguinous when the infection is by the gas organism alone, or purulent when the latter is contaminated with pyogenic bacteria.

Bashford has given the best description of the microscopical pathology. Nearest to the surface of injury is a zone of dead muscle fibers (dark staining) embedded in disorganized blood-clot. Next is a zone of "ground-glass" appearing fibers, which are also dead. Outside of this the fibers are greatly fragmented and depart from the normal in being widely separated and in often losing their cross-striation. Bundles like these are interspersed with normal looking bundles or with those in which the fibers are broken into longitudinal fragments. Bashford believes this fragmentation not to be specific; it is due usually to improper histological fixation and can be reproduced in any laboratory animal.

The muscle sheath shows hæmorrhage and leucocytic infiltration, as well as dilated and engorged vessels. The fibrous tissue is densely infiltrated with leucocytes and this is most abundant where the bacteria are in greatest variety. The infiltration extends into adjacent muscle fibers for a distance of several longitudinal layers, but ends abruptly between any two bundles. As soon as the endomysial space becomes crowded with bacilli the leucocytic infiltration stops, and only rarely are any bacilli seen in the leucocytic zone.

Bubbles of gas can be seen with the naked eye and many more are visible with the microscope between the muscle fibers or bundles, beneath the sheath and in the sheath itself. They are in-

variably between bundles of fibers and never in the fibers themselves. The arrangement of leucocytes and bacteria around a bubble is constant; they appear to have been pushed aside. The muscle fibers also appear as if pushed aside, but nowhere do they show signs of pressure; the same appearance of lack of pressure is seen in the leucocytic infiltration and in the capillaries.

At the site of injury the bacteria in abundant flora are gathered very thickly. For a short distance from the edge they appear more abundant, but deep down they seem to be composed wholly of long bacilli. The sheath of the muscle is invaded for a short distance. Most of the bacteria have invaded into the lymph-spaces. As they proliferate, the bacteria follow the track of the vessels: from the lymph space they spread along the capillaries, and apply themselves closely to their walls or to the sarcolemma of adjacent fibers; and are often arranged longitudinally. The bacteria are nowhere found in capillaries. The muscle fibrils themselves are entered only when the sarcolemma is destroyed. Along the capillaries, in a region of moderate infection, leucocytes are present and are actively phagocytic.

At the margin of bacillary invasion the muscle fibrils in some places exhibit striation, in others are swollen and homogeneous; and there are irregularities in the number of sarcolemma nuclei. In some places the bundles are packed closely together, in others visibly separated; in the latter the resulting spaces are full of fresh or old, altered or homogeneous blood. The connective tissue fibers are œdematous and the capillaries stand out very prominently. Leucocytosis is scant or absent, and is a striking feature of the advancing margin of the pathological process. This is also marked in experimental infections in animals; in these the peritoneal, pleural, pericardial, and œdema fluids are also devoid of white blood-cells.

*Circulatory disturbances.* There is much extravasated blood in the tissues and an increased accumulation of fluid in the endomysial space. The endothelium is proliferated, or swollen and vacuolated. Later the capillaries and small veins rupture. These may become disintegrated and embedded in old or recent hæmorrhage. Thrombosed veins are common. No excess of polynuclear white cells are seen in the extravasations; mononuclears predominate. Thrombosis is common in all septic wounds and is the usual cause for secondary hæmorrhages. It is venous in origin in 70 per cent. Thrombosis is quite commonly seen on the proximal side of the wound. Ex-



tensive blocking may accompany small wounds. It may occur some distance from the wound. Capillary thrombosis may extend far ahead of the obvious infectious process.

The lymphatics are difficult to recognize. They may be obliterated by pressure, or may collapse because of the poor circulation. Bashford assumes that there must be similar changes as in other infections.

It is not common to find bacilli inside the blood-vessels, except when the blood is clotted or broken down. When found at the margin of invasion it indicates that bacilli are constantly entering the blood stream.

The rapidity of onset and of the spread of infection is truly remarkable and is the most astonishing thing of this disease. Chalker noted that in 108 cases of gas infection, the process was recognized within twenty-four hours in 16 per cent; in from three to six days in 18 per cent; and before the seventh day in all. McNee and Dunn saw the infection established in one soldier three and one-half hours after the reception of the wound; the fatal issue followed nine hours later. They suggest that the rapid spreading of the process is due to the anatomy of muscle, in which there are sheaths enclosing long fibers which are detachable. When so, detached spaces are formed within the sheath and the latter are quickly filled with toxic material which causes necrosis of the fibers.

#### FACTORS IN THE PRODUCTION OF GAS GANGRENE

Ivens classified the factors which aid in the development of gas gangrene as follows:

1. Proximity to contaminated soil. Gas gangrene develops three times as frequently in wounds of the lower limbs.

2. The kind of projectile. Shell wounds are followed six times as frequently as other injuries by gas gangrene.

3. The presence of foreign bodies. It has been repeatedly demonstrated that bullets, dirt, clothing, etc., both in the wounds and outside of the wounds, are constantly harboring the perfringens organisms. In some of the reports the frequency runs to 100 per cent.

4. The interval between the reception of the wound and the first dressing.

5. The importance of early treatment in the prevention of gas infection.

6. The presence of vascular injuries. This applies to the application of a tourniquet. Wallace points out that it is easy to distinguish between the purplish-brown dead muscle due to

cutting off of the blood supply, and the non-contractile and peculiar translucent red color of muscle (which may or may not crepitate) dead of gas gangrene.

7. Concomitant fractures. Sixty per cent of wounds with gas gangrene also had fractures.

8. Location of the wound. Wounds of the calf, hip, or trunk are especially dangerous.

9. Much tissue injury.

10. Increase of the intramuscular tension.

11. Joint injuries. These were present in 13 per cent of wounds infected with gas organisms.

Emery points out that the growth of the gas organisms depends very largely upon the abundance of the sugar supply. That explains why muscle tissue plays so prominent a part in the pathological process. A number of men believe that gas gangrene will not develop in other tissues and believe that the subcutaneous gas is secondary and lodges under the skin after escaping from the muscle.

#### THE RELATIONSHIP OF THE BACTERIOLOGY TO THE PATHOLOGICAL PROCESS

Douglas, Fleming and Colebrook made a number of interesting experiments which elucidate a great many of the clinical facts. *Bacillus perfringens* was found to grow much more rapidly in symbiosis with streptococci, staphylococci, diphtheroids, *bacillus proteus*, *bacillus pyocyaneus* and a coliform bacillus, either singly or in groups. The growth was equal in amount in fresh serum, or in serum in which the alkalinity and the antitryptic power were neutralized. All strains of diphtheroids were found equally efficient in stimulating this growth. Under these conditions an infinitely smaller number of perfringens bacilli would grow than would when a pure culture was being grown. *Bacillus perfringens* and streptococci, grown in symbiosis, result in a more abundant growth of each organism. When the culture also includes staphylococci an enormous increase occurs in the cocci. Streptococci cultivated in symbiosis with diphtheroids give a much more abundant growth than when grown pure; the diphtheroids were, however, approximately 50 per cent less. Diphtheroids and other bacilli absorb oxygen, but this property is apparently not sufficient to account for the increased proliferation that occurs when aerobes and anaerobes are grown in symbiosis.

The *bacillus oedematis maligni* and the *bacillus Hibler IX* also grow much more rapidly when the cultivations include the other organisms mentioned above, and in the same groupings or combinations as were described.

The conditions of the wound reproduce with fidelity the artificial cultivations in the test tubes. The experiments explain the extreme rapidity of the growth and spread of the infectious process, since only a few organisms, growing in association with the other contaminants, are amply sufficient for a most virulent infection.

Tissier believes that anaerobic organisms do not develop their toxic properties except when grown in symbiosis with aerobes. However, Taylor, and Weinberg and Seguin have obtained no definitely significant results in laboratory experiments with combinations of aerobic and anaerobic organisms. Weinberg and Seguin worked very extensively with anaerobic organisms and determined that both the Welch bacillus and bacillus oedematiens were aided very greatly by the bacillus histolyticus in their growth and in the consequent spread of infection. It seems that a suitable culture medium is prepared for the gas organisms by the histolyticus bacillus, the latter causing a breaking down of the tissues into hæmorrhagic masses, in which antibacterial resistance is greatly lowered. Bacillus sporogenes also accomplishes the same result in a similar way. Especially fatal is the symbiosis of perfringens and oedematiens organisms: the combination stimulates one another; the oedematiens bacilli flourish more easily and extensively and overgrow the other; their superior toxicity usually determines the fatal result. These results can be reproduced in animals.

The pathology of gas gangrene has been explained in one of two ways: D'Este Emery believes that the toxin of the Welch bacillus is the sole cause of the process and that the toxins which are developed kill the leucocytes and prevent the emigration of white blood-cells into the healthy parts adjacent. The rapid spread of the infection is thus encouraged. Taylor agrees that the Welch bacillus is the sole agency, but disagrees as to the effect of the toxins. Taylor has determined that there is: (1) a bacillary endotoxin which has no toxic action in animals; (2) a bacillary exotoxin which seems to be a definite proteolytic substance and which exhibits the main toxic manifestations; (3) a tissue toxin which is developed in the destroyed tissues. The clinical picture resembles very much that which is seen in fatal burn cases in which there is much tissue destruction, and with this analogy in mind, Taylor believes that much of the toxic manifestations seen in gas gangrene can be directly attributed to the poisons developed from the destroyed and gangrenous tissues.

In Taylor's experience 70 per cent of all wounds, as seen at a general military hospital, harbor the gas organisms and are potentially infected. This is followed by a stage in which the infectious process actually develops and is characterized by the production of gas which is retained under a constantly increasing pressure, until the tissues are dry and anæmic. Gas gangrene is now present. According to Taylor the gangrene results from mechanical conditions.

Wallace takes a middle path and believes that there is truth in both of these theories. There are three paths of infection: (1) direct extension; anatomical appearances do not seem to favor this mode of spread and it is very rare for direct extension to occur to intact muscles. The appearances of the fascial planes do not suggest them as furnishing the paths of infection; (2) along the inside of blood-vessels just before or after the circulation has ceased, the organisms gaining entrance by the open ends of vessels in compromised territory; proof of this was furnished by Dunn who found Welch bacilli in clotted brain vessels after a wound of the carotid artery; (3) systemic infection. Cases have been reported in which gas infection has occurred at a distance from the primary wound, in saline injection areas, or in areas at a distance which have been subjected to pressure. Wallace believes that the toxins must play some rôle inasmuch as it is difficult to account for similar microscopical pictures when there are few or many bacilli, or little or extensive distention of the tissues with gas. He does not appear to be certain as to the source of the toxin.

Lately some experiments of Bull and Pritchett have seemed to lend additional weight to the theory of D'Este Emery. Experiments with culture filtrates have shown that bacillus aerogenes capsulatus excretes a toxin of high potency. The toxin produces effects of two kinds: (1) hæmolysis; and (2) inflammation and necrosis of muscles and subcutaneous tissues. Bull and Pritchett believe that gas gangrene is a local process with a general intoxication, the toxins resulting from the growth of the organisms. These experiments are corroborated by the results Bull and Pritchett obtained from the exhibition of the antitoxic serum which they have elaborated.

#### CLINICAL FORMS OF THE DISEASE

1. *The classical form of the disease.* The best description of this form was given by Fauntelroy. The first stage combines the injury, plus the driving in of foreign material which results in the infection and localized necrosis, and is usually



accompanied by more or less shock. As soon as necrosis appears it is fairly certain that invasion by organisms has begun. The prodromal symptoms are those of the initial shock and sapræmia.

Within ten to thirty hours after the injury the temperature rises one or two degrees; the pulse becomes more rapid. There is slight headache, malaise, anorexia, and moderate thirst. A splint on the part eliminates the pain. In these early stages there is little beyond the nature of the wound to indicate the gravity of the condition. Within the next day or two there is a small degree of swelling, gas develops in the tissues which lose some of their elasticity. A progressive brownish-coppery mottling of the skin appears and with it a characteristic fetid odor is noted. Crops of blebs, varying in size from that of a pea to several inches in diameter, develop. The fluid in the blebs is straw-colored or sanguinolent, frequently contains staphylococci and very rarely perfringens bacilli. The discharge from the wound is thin and sanguinous, and contains typical bacilli.

The symptoms bear a direct relation to the size and situation of the wound, to the amount of trauma, to the time elapsing before treatment is instituted, and to the kind of treatment. The process may extend to the trunk from any one of the extremities.

The second stage is noted by the progressive gas production. The circulation becomes disturbed and there is a progressive weakening of the pulse. The grade of the infection usually begins to appear at the end of forty-eight hours. The temperatures range to  $104^{\circ}$  or  $105^{\circ}$  and the pulse runs up out of all proportion with the temperature. The discharge is now characteristic. There is marked crackling in the tissues. The brownish-coppery color continues to spread, the tissues are more and more indurated, and there are decided circulatory changes.

Generally, there is marked headache, anorexia and a constant restlessness. The facies are dull and stupid. All of these symptoms are progressive and last from one to three days. Toward the end of this period the virulence of the infection seems to increase.

The final stage begins insidiously with a deepening of the stupor which is followed by a rapid overwhelming of the system with the manifestations of a grave blood infection. Occasionally there is a "typhoid" state with coma vigil, carphologia, and a steady decline of heart and respiration. The end frequently comes very suddenly.

The postmortem examination shows the usual "foamy" organs described by Welch. The vessels

are full of gas bubbles and it is thought that the sudden death is caused by gas embolism of the heart and great vessels.

2. *Toxic and œdematous forms.* Some of the cases develop a profound toxæmia and the whole course of the illness takes comparatively few hours. In other cases it is difficult to believe that the enormous œdema, with little or no crackling, is not an erysipelas.

3. *Mixed forms.*

4. *Localized gas abscesses.* These are said to be due to mixed infections.

5. *Superficial and deep gas phlegmons.* These may be very serious.

6. *Chronic and latent infections.* Cases of gas infection can develop a long time after the reception of the injury and when the wound is apparently in good condition and healing. An infection which has once subsided may flare up suddenly after a secondary operation is performed.

7. *Gas septicæmia and pyæmia.*

#### BLOOD CULTURES IN GAS INFECTIONS

For this purpose, Anderson and Richardson were able to classify the cases of gas gangrene in the following types: (a) a fulminating type with a rapidly spreading gas gangrene, hyperpyrexia, profound toxæmia, and terminal septicæmia; the bacillus of Welch was recovered from the blood in one of four cases; (b) a fulminating type without local gas formation and with subnormal temperature; only one case of this kind was encountered, this form being very uncommon; no blood culture study was, unfortunately, made; (c) a mild type with gas formation, mild constitutional symptoms, and, as a rule, a favorable issue. There were four cases of this type in the series reported and the gas bacillus was found in the blood of all four. All recovered except one; the latter died of a complicating tetanus infection. "Such patients appear to be rarely in a serious condition, certainly never so ill as to lead one to suspect the true clinical character of the disease." The foul wound presents all the usual characteristics of one thoroughly infected with the usually found group of organisms, bacillus perfringens, bacillus œdematis maligni, bacillus Hibler IX, bacillus pyocyaneus, streptococci and staphylococci; and there is marked reaction in the surrounding parts with pain, œdema and slight crepitation. There is a moderate irregular temperature. The skin is dry and of a dirty yellow color and there is a subicteric tint to the conjunctivæ. Mentally the patients are "heavy, stupid, and somnolent." This torpid state con-

tinues until the blood is sterile. Meanwhile the healing goes on undisturbed.

Anderson and Richardson point out that such a mild condition would escape notice. They have frequently seen the establishment of a similar clinical state during the acute stage of a wound which lasted for a day or two and subsided; these periods were coincident with a recrudescence of infection. It is highly probable that the method of production of metastatic foci of gas gangrene at a distance from the primary wound reported by Taylor and others finds its explanation in these temporary states of bacteræmia.

#### THE X-RAY

Lardennois and Pech obtained some interesting facts by studying with the X-ray limbs which had become gangrenous. A normal limb shows (control observations) a homogeneous gray shadow of the musculature surrounding the central bony skeleton. A limb in which an ordinary inflammation is going on shows a picture similar to the first except that the limb is swollen and the outlines of the muscles are somewhat more distinct.

A limb in which gas gangrene is taking place gives distinct pictures which depend on the stage of the process. In the beginning a light area corresponding to the destroyed tissues surrounds the missile track. Later the individual muscles which are affected become visible by an irregular spotting and striation. As the muscles are more extensively destroyed, the clear spaces become larger and are present in moderate numbers. A characteristic appearance is obtained.

In a limb which is gangrenous without gas formation, almost normal pictures are seen.

#### COMPLICATIONS

The most important complication, and the one to be feared most, is tetanus. According to Weinberg and Seguin, this complication occurs in 13 per cent of the cases.

#### PROGNOSIS

This is judged by the following criteria:

1. The character and extent of the injury. Deep, narrow, destructive wounds give a grave outlook.
2. The involvement of the main vessels (massive gangrene).
3. The pulpification of the tissues.
4. The length of the interval before proper treatment is afforded. This is the most important factor.
5. The stage of the process and the virulence of the infection.

#### TREATMENT

In a military environment, Fauntelroy recommends certain prophylactic measures such as: (1) covering the trench floor with faggots; (2) treating the trench walls with slaked lime; (3) providing uniforms manufactured from hard finished cloth; (4) encouraging personal cleanliness by the soldier. If the soldiers reach the surgeons' hands within the first twelve hours after being wounded, an attempt at an abortive treatment should be made. This comprises the steps enumerated below, carried out, if that be possible, even more thoroughly than indicated.

Whenever circumstances warrant, and this is paramountly so in the injuries of the present war, every wound should be treated with suspicion and should be regarded as potentially infected with gas organisms. The corollary is obvious and implies first aid as soon as possible after reception of the injury. Immediate and thorough cleansing, with and without antiseptics, and the removal of every variety of foreign body, in the opinion of Leriche, will accomplish a cure with no, or little, suppuration, provided it is done reasonably soon.

The absolutely essential steps in this all-important primary procedure include: (a) the opening up completely of the entire wound including all pockets; (b) the removal of all dirt and the mechanical cleansing of the wound; (c) the removal of all foreign bodies; (d) the eradication of all hæmatomata, small and large; (e) the removal of all muscle tissue which is in any way compromised; (f) complete hæmostasis.

Nacciarone makes as many incisions in the long axis of the limb as are found necessary and deepens these between the muscles down to the bone. The territory compromised is delimited with the cautery, and thereafter he irrigates the parts with iodine solution. A number of tubes are inserted for drainage. The irrigations are repeated from one to three times in the first twenty-four hours. When it was possible to carry out this procedure in the first six hours, 90 per cent of the cases were cured; in the first twelve hours, 88 per cent were cured.

If there is much distention of the limb causing an increased intramuscular pressure, the number of incisions made must be adequate to relieve this thoroughly before it has had time to cause gangrene. It is important to find the hidden hæmatoma or necrotic area from which the gas is being formed. The degree of distention is frequently so marked that the large incisions are immediately closed by the protrusion forward of the swollen



muscle bundles and some mechanical aid must be utilized to keep the incisions open.

Wallace points out that it is essential to avoid all pressure or other impediment to the circulation. If there is involvement of the main vessel of the limb, all attempts to restore the continuity of the blood stream must first be made before ligation is considered.

In excising the wound track, a method which is very popular at present, it suffices to remove the toxic and gangrenous tissues with the whole zone of infection. Realizing that the process is almost invariably limited to within the muscle sheath, Frankau, Drummond and Neligan have recommended resection of the single muscle or muscle group which is involved. This is possible only when the main vessel of the limb is intact, and is contra-indicated when the result would yield a useless limb.

In dealing with bone wounds, it is expedient to remove all bone fragments, those that are loose, or are thoroughly ground with dirt and other foreign matter, as well as those which have periosteal attachments which under ordinary circumstances one would be tempted to leave, inasmuch as, in the presence of infection with gas organisms, they might cause trouble later on. In any of the operative procedures outlined here, the use of a constrictor is contra-indicated; it may lead to a rapid spread of infection.

It is imperative to institute wide and abundant drainage; and it has been found of great advantage to introduce some method of chemical and mechanical sterilization. Irrigation of the wounds is preferred, and Dakin's solution, applied after the method of Carrel, is the antiseptic of choice. In the after-care of these wounds special attention should be given to insuring for the wound surfaces a maximum amount of fresh air and sunshine. All of the authors comment on the value of these agents in hastening the healing. The injection of oxygen into the tissues is regarded as being not beneficial and by some men as being harmful.

In a general way the question of amputation is to a great degree decided by the general surgical judgment of the surgeon. This is especially so in late amputations. Immediate amputation is indicated as a life-saving measure in the hyperacute and rapidly spreading cases; in massive gangrene with, and sometimes without, blocking of the main vessel; and where the local resection of the compromised territory would yield a useless limb functionally. In the latter case, however, amputation would be contra-indicated if the patient's general condition would not justify

the extra hazard. Wallace points out that the extent of the skin crepitation is no indication of the necessity of amputation. It need not correspond with a sufficiently severe subcutaneous condition that would require amputation. It is necessary to actually inspect the whole of the involved area before making the decision.

The technique of amputation for gas gangrene is distinguished by the avoidance of any suturing of the resulting stump. If flaps are made, they are left wide open. The French surgeons have strongly advised a "flush" amputation, in which skin, fascia, muscles, and bone are divided on the same plane. It is frequently possible to avoid secondary operations for the closure of the wound, resulting from the latter type of operation, by the judicious use of various traction apparatuses applied to the skin. Frequently, too, the extension of the process beyond the plane of amputation on the proximal side makes necessary various lateral incisions in the stump, with the object of obtaining more ample drainage.

#### SERUM TREATMENT

A number of sera have been prepared which have been employed in gas infections. At the beginning of the war, Weinberg and Seguin elaborated an antitoxic serum against bacillus perfringens. It showed some good results but was not entirely satisfactory and the belief was expressed that polyvalent serum, prepared with all of the organisms commonly encountered in the wounds, would probably be more efficacious. Sera have also been prepared against bacillus cedematiens and against the vibron septique.

Laclainche and Vallee made a polyvalent serum for use, especially in wounds containing streptococci. It showed some good results, according to Quénu, Bazy and Routier, in counteracting the secondary flaring up of a gas infection which sometimes occurs after a late amputation.

In the earlier part of this review some experiments of Bull and Pritchett were mentioned, who discussed the toxins in the filtrate of cultures of Welch bacilli. An antitoxin has also been prepared, in a manner similar to that in which the diphtheria antitoxin is made. In animals the protective qualities of Bull and Pritchett's antitoxin were marked and would neutralize the gas toxins in a manner very comparable in its efficiency to that of diphtheria antitoxin. A serum prepared of any one strain seems efficacious against all other strains. At the present writing this antitoxic serum seems to be the best of all so far prepared.

## RESULTS

Of 464 cases of gas infection, 42 were fatal; 25 died from gangrene, 4 died from tetanus, and the rest from the severe injuries which they had sustained. When the gangrene was limited to a group of muscles, it was possible in 41 cases to do a local excision; of these 33 recovered. Amputation by the open method and with lateral skin incisions was practiced 65 times; 48 of these recovered. These are the results published by Ivens. Zindel reported that the mortality of gas infection in military wounds varied from 12 to 53 per cent, in contradistinction to a mortality of 70 to 90 per cent in gas infections following civil injuries.

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# ABSTRACTS OF CURRENT LITERATURE

## GENERAL SURGERY—SURGICAL TECHNIQUE

### OPERATIVE SURGERY AND TECHNIQUE

**Fiolle, J., and Delmas, J.: Exposure of Deep Vessels by Wide Routes of Access** (*Découverte des vaisseaux profonds par des voies d'accès larges*). Paris: Masson et Cie., 1917.

The preface of this work was written by Pierre Duval, whose wide experience in the surgery of the present war renders his opinion of the highest value. The authors disclaim any attempt to modify the classical procedures of arterial ligation. They state that the admirable work of Faraboeuf has laid down the principles of ligation of a healthy vessel in healthy tissues, and that his procedures and technique will forever remain the methods of choice for the exposure of a given vessel, for the hæmostatic ligation preliminary to the first stage of any operation, and for the permanent ligation in the indirect cure of an arterial aneurism.

But wounds of war have shown the necessity of a new vascular surgery. From their experience the authors describe the usual intervention in a vascular war wound. The limb is infiltrated with blood and it is impossible to know which vessel has been injured. Often the situation is perilous; the hæmorrhage has been serious, arrested by a tourniquet. Using the classical methods, how is one to know which incision to choose so as to avoid exposing the wrong vessel, or if the wound has involved two vascular trunks, to escape leaving one unexplored with fatal result?

Under these conditions they show the surgeon working in the bleeding region, but seeing nothing. One, two, several clamps are applied at random, and the hæmorrhage continues. Boldly a clamp is applied to the whole mass. The blood no longer flows but the blind clamp has grasped everything at once, both the bleeding vessel and others which are not involved; sometimes also a nerve which will suffer for a long time from their crushing, even though it be temporary. The victory has cost too dear.

The scrupulous care of Delmas and Fiolle has incited them to look for methods which, by a wide view of the deep vessels of the limbs, allow direct examination of the vascular trunks through a great length, a clear view of all the vessels which in one region can together or separately be injured by a war wound. The authors will certainly be criticized both for the length of the incisions and the section of certain muscles. But it must not be forgotten that in present war surgery the immediate reconstruction of all the anatomic planes cut

by the wound or by the operation is the method of choice.

Delmas and Fiolle apply their procedures especially in war surgery. Duval states that he has employed them and that they are perfect, rapid, and permit a precise vascular surgery of which it can be said that nothing is added to the gravity of the vascular wound.

But this wide exposure of deep vessels is not applicable solely to war surgery. Modern vascular surgery demands new procedures, wide routes of access which facilitate the performance on the vessel of quite other operations than the simple passage of a ligature around a half centimeter of carefully isolated artery.

The procedures which these authors describe are, by the wide exposure of deep vessels, the basis of all present day vascular surgery.

The classical methods of ligation will always remain necessary both in the apprenticeship of all students of surgery and the procedures of choice for simple ligation of the vessels.

Vascular surgery requires broader routes of access; war surgery, by its imperative necessities, has been the occasion for giving them birth.

The operations described by the authors involve exposure of the following vessels: (1) posterior vessels of the leg in the region of the calf; (2) anterior vessels in the upper half of the leg; (3) first portion of the anterior tibial artery; (4) popliteal artery and its branches; (5) femoropopliteal trunk; (6) vascular trunks of the buttock; (7) vessels of the upper third of the forearm; (8) axillosubclavian trunk; (9) great trunks of the base of the neck and their intrathoracic course; (10) common carotid and internal jugular from the clavicle to the upper border of the thyroid cartilage; (11) great trunks of the neck from the upper border of the thyroid cartilage to the base of the skull.

Of these only a few examples will be briefly discussed in order to give an idea of the general principles involved.

*Posterior vessels in the region of the calf*, i.e., posterior tibial and peroneal. These vessels are deeply situated in the muscular masses of the leg; the classical incisions only expose one vessel at a time, and do not give a wide view. The authors' operation is briefly described as follows: With the anesthetized patient lying prone, the incision (30 cm. long) begins two finger-breadths below the bend of the knee between the two heads of the gastrocnemius, 1 cm. within the median line; it descends at first vertically and then curves slightly inward to

embrace in its concavity the inner belly of the gastrocnemius, reaching the inner border of the tendo achillis which it follows to 2 cm. above its insertion, equidistant from the tendon and the internal malleolus. The external saphenous vein and nerve are exposed by the incisions. They are quickly drawn to the outer side. The nerve is an excellent guide to the interspace between the two heads of the gastrocnemius. The superficial fascia at the inner edge of the tendo achillis and parallel to the latter is cut.

The index finger is introduced into the opening and pushed in front of the tendon. The finger easily passes upward in the lax cellular tissue in front of the soleus, and will act as a guide for section of the muscles. The heads of the gastrocnemius are quickly separated, then the soleus is incised vertically through its middle, the index finger alone serving as a guide. The muscle should be split very widely in the direction of its fibers, the tendo achillis being divided into an internal and an external bundle.

The index finger is now withdrawn; the two muscular masses are separated by means of broad abdominal retractors. It is thus easy to see the posterior tibial nerve very white and voluminous, and close to it on the inner side the posterior tibial vessels; externally, about  $1\frac{1}{2}$  cm. from the nerve are seen the peroneal vessels. These structures may be traced for a distance of 8 or 10 cm., and any operation on them can be accurately performed.

Anatomical restoration is very simple, requiring only the approximation of the large muscular bundles with a few catgut sutures loosely applied, and the closing of the posterior fascia which gapes in places.

*Arch of the anterior tibial artery.* Origin from the popliteal, passage through the interosseous space. In the treatises on operative surgery, this high and deep portion of the anterior tibial is never considered. Faraboeuf simply remarks that ligation of the anterior tibial on the front of the leg becomes more difficult the higher it is attempted. This difficulty grows into an impossibility when the vessel is bleeding, especially in its passage through the interosseous space and in its short course on the posterior side of the bones. It describes a true arch in this region, running anteroposteriorly around the free margin of the interosseous septum.

Ordinarily, lesions of the vessel in this region are treated by ligation of the popliteal above and the anterior tibial below. This is a serious operation, carrying danger of gangrene, while the operation of the authors conserves the vitality of the limb.

In the authors' operation, the patient lies prone, the lower limb slightly flexed, abducted and externally rotated so that the inner surface of the knee and leg firmly rest on the table. A bayonet-shaped incision is made beginning 3 or 4 finger-breadths above the insertion of the tendon of the biceps into the head of the fibula and passing along the posterior edge of the tendon. Behind the neck of the fibula the incision crosses it diagonally and then descends

straight on the external surface of this bone, to end midway between the head of the fibula and the external malleolus.

The superficial fascia of the thigh and leg is opened parallel to the cutaneous incision. The finger is then able to isolate the biceps above, the outer head of the gastrocnemius below and from behind forward, the tibial origin of the soleus and the peroneus longus. The external popliteal nerve is isolated and drawn outward. Perpendicularly to the direction of their fibers and 2 or 3 cm. from their upper insertions, the outer head of the gastrocnemius and the soleus are cleanly divided. This already gives a wide access to the lower part of the floor of the popliteal space. Already the termination of the popliteal vessels, the origin of the anterior tibial, peroneal and posterior tibial can be seen. But all of these structures are as yet deeply situated, accessible only to the end of the finger, separated from the operator by a rigid obstacle that must be removed, the fibula.

The external popliteal nerve being drawn well externally, the neck of the fibula is bared sufficiently to allow the passage of a Gigli saw but not enough to destroy the attachment of the peroneal muscles. The Gigli saw cuts the bone as high as possible. At the lower end of the skin incision, externally to the peroneus longus muscle and along the outer intermuscular septum a pedicle needle is passed down to and through the interosseous membrane, its point appearing posteriorly and carrying with it the end of a Gigli saw. The neighboring muscles are protected by retractors, and the fibula is quickly cut at this new point, without any risk of injury to the external popliteal nerve and its terminal branches, which have been previously isolated and drawn aside. The attachments of the peroneus longus, carefully preserved as far as possible, will assure the vitality of the fragment of fibula liberated by the two saw cuts.

The fragment must now be freed so that it can be swung downward. It is held now only on its inner border by the very resistant interosseous membrane. This is put on the stretch by seizing the upper end of the fragment with the fingers of the left hand, or better, with Faraboeuf's forceps, and drawn vigorously outward. The membrane is cut level with its insertion, permitting the fragment to be swung downward, rendering all parts of the operative field and the vessels widely accessible for any operation.

In spite of the number of stages described, nothing truly mutilating has been done. The two portions of the divided soleus and of the external head of the gastrocnemius are reunited end to end with a few catgut sutures. The fragment of the fibula is then put back in place. Below, bony coaptation is assured by the periosteum of the external surface. Above, suture of the cut fibers of the peroneus longus fixes the fragment in position. The superficial fascia is sutured, especially above, so that the sciatic nerve shall be well kept in place in its tract behind



the biceps tendon. The skin is closed with horsehair. If drainage is indicated, it is easily obtained by a tube left under the soleus and emerging through the lower end of the skin incision. It is well to maintain for a few days the leg flexed on the thigh and the foot extended on the leg in order to relax the sutured muscles.

*Vascular trunks of the buttock.* Hæmorrhage from these vessels may be very severe; in war surgery, gluteal hæmatoma has acquired a just reputation for gravity, due not only to the abundance of the loss of blood, but due also to the difficulty of hæm-o-stasis.

The groups of vessels to be considered here are three in number, namely, the gluteal, sciatic, and internal pudic. The causes of difficulty in dealing with hæmorrhage from these vessels are:

1. The vessels are deeply situated under the thick mass of the gluteus maximus.

2. The classical incisions, separate for each artery, are quite inadequate.

3. There is not only one vascular group but three, and it is impossible to know, when a wounded buttock is distended with blood, which is the injured trunk.

The classical incisions give access to only one or two arteries, and moreover present great difficulties owing to passage through the gluteus maximus. The authors' technique permits a wide exposure of all the vessels of the region, without section of the muscle.

The patient is placed in the prone position, the affected side being slightly raised by a folded towel under the hip. The incision begins at the middle of the external surface of the great trochanter, three finger-breadths below its upper border. It passes vertically upward to 2 cm. above the trochanter, then curves slightly upward, inward and backward, to within 2 cm. of the posterior superior spine of the ilium. The thick fatty tissue thus exposed is cut through down to the aponeurosis of the gluteus maximus and in the direction of the fibers of the latter.

The vessels are situated between the gluteus maximus behind, the gluteus medius, the pyriformis, the obturator internus and the gemelli in front. The space in which they are found is filled with very lax cellular tissue, which allows an easy separation of the muscles. To reach this space, at the lower part of the incision, the aponeurosis over the great trochanter is cut vertically, the index finger is inserted into the opening and passed over the posterior surface of the trochanter, then directed upward and inward. Without any difficulty it penetrates beneath the gluteus maximus, the muscle planes separating easily, until the great sciatic notch can be felt. The outer border of the gluteus maximus is marked by a white line of fascia where it overlaps the gluteus medius. This line of fascia is cut with scissors upward as far as the crest of the ilium. A broad retractor may now be passed beneath the gluteus maximus, drawing it backward and inward.

The whole vascular region appears, completely exposed.

Anatomical restoration is brought about by simply returning the gluteus maximus to its normal position, and holding it there with a few sutures passed through the fascia.

*Great trunks of the base of the neck and their intra-thoracic course.* On the right are the superior vena cava, innominate vein, innominate artery and its bifurcation. On the left are the innominate vein, common carotid and subclavian arteries.

Aneurisms of the arterial trunks arising from the arch of the aorta are quite common. Distal ligation is generally insufficient. Double ligation, proximal and distal, is preferable, but only gives truly good results when accompanied by extirpation of the sac. In spite of the relative protection afforded by the sterno-costo-clavicular breastplate, the great vessels of the base of the neck are not infrequently wounded. Generally under such conditions there will be present a diffuse arterial or arteriovenous hæmatoma in the region of the superior mediastinum and base of the neck. Intervention is absolutely necessary to close the vessel wound, whatever its situation, if fatal secondary hæmorrhage is to be prevented.

The operative technique of Pierre Duval, first described in 1910, is employed. The patient lies on his back with a pillow between the shoulders. The incision begins exactly in the median line at the junction of the manubrium with the body of the sternum, ascends vertically to the suprasternal notch, passing down to the bone. The incision curves outwardly parallel with the upper border of the clavicle a finger-breadth above the latter, terminating externally about the middle of the clavicle. The sternal and clavicular heads of the sterno-cleido-mastoid muscle are severed just far enough from their insertions to allow suture of the stumps at the end of the operation. The sterno-hyoid and sterno-thyroid muscles are likewise cut through, after passing a grooved director beneath them.

The clavicle is bared at about its middle and cut through with a Gigli saw. With chisel and mallet a vertical section of the sternum is made in the median line from the sternal notch to the upper border of the second costal cartilage. At the lower end of this section a second transverse cut is made toward the side involved. The angular flap thus made has now no other skeletal attachment than through the cartilage of the first rib. This is exposed and cut through as far as possible from the sternum in order to pass externally if possible to the powerful costoclavicular ligament. This maneuver can only be done through the fibers of the pectoralis major. The angular flap, now attached only by skin and muscles and consisting of the inner half of the clavicle, half the manubrium and the first costal cartilage, is swung carefully and slowly downward and outward, its deep surface being freed from any intrathoracic structures which may be adherent



to it. Thus, above, the large innominate venous trunk, fixed to the clavicle by the middle cervical fascia, and below, the pleural dome, must be carefully liberated. The great vessels are thus exposed, differing according to which side is opened.

Reconstruction of the region is easily achieved to give a functionally perfect result. It is divided into four stages: (1) replacement of the osteomuscular flap; (2) fixation of clavicle and sternum with wires at sites of section; (3) reunion of severed muscles with catgut sutures; (4) horsehair sutures for the skin.

*Common carotid and internal jugular from the clavicle to the upper border of the thyroid cartilage.* No exposure is easier, in the laboratory, than that of the internal jugular and the common carotid. But in actual practice, this classical method has only one application, i.e., exposure of vessels known in advance to be intact. Some of the commonest conditions requiring an operation on these vessels are recent wounds, rendering dissection very difficult or impossible, owing to the free hæmorrhage, aneurisms of various kinds, and dissection of cervical glands.

The classical incision is inadequate, and the obstacle to wide exposure of the vessels is the thick, almost immovable mass of the sterno-cleido-mastoid muscle, which covers the carotid sheath. The authors' operation consists essentially in section of this muscle with the least damage possible, and permitting a complete repair. With a folded towel between the shoulders and the face turned toward the opposite side, the incision is made from the tip of the mastoid to the sternal insertion of the sterno-cleido-mastoid muscle in the groove between the muscle and the larynx and trachea. The incision at its lower end turns abruptly and follows the upper border of the clavicle to the middle of that bone, just short of the external jugular vein. Through the entire length of the vertical incision the platysma and deep fascia are split, over the anterior border of the sterno-cleido-mastoid.

The finger is passed beneath the muscle, which is stripped throughout its entire length. The sternal head of the muscle is well isolated with the finger beneath it, and cut through with scissors 1 cm. above its insertion. The clavicular insertion of the muscle is detached in the same way after passing the finger beneath it. After freeing the muscle from its remaining attachments throughout its entire length, it is thrown backward with the overlying skin. It is not necessary to incise the underlying omo-hyoid muscle, which can be drawn either upward or downward as the case demands. The carotid vessels in their sheath can now be readily isolated by blunt dissection.

Anatomical restoration is now brought about by returning the musculocutaneous flap to its place, the two heads of the muscle being fastened with a few sutures.

*The great trunks of the neck, from the upper border of the thyroid cartilage to the base of the skull.* These

are the internal carotid, external carotid and its branches, and the internal jugular.

The same reasons for wide exposure of the vessels in the upper part of the neck apply as in the lower part. The obstacles to wide access here are not only the sternomastoid muscle, but also the posterior belly of the digastric. The angle of the jaw, the mastoid process and the lateral tubercle of the atlas also cause great inconvenience. The operation described has for principle the backward retraction of an osteo-musculo-cutaneous flap, comprising the tip of the mastoid, the sterno-cleido-mastoid muscle and the corresponding skin.

A pillow is placed beneath the shoulders, the head being turned to the opposite side. The incision begins a few millimeters behind the base of the mastoid process and curves forward toward the ear to embrace in its concavity all the lower portion of the mastoid process. From the postauricular groove it descends obliquely down the neck, following the anterior border of the sterno-cleido-mastoid, terminating 3 cm. below the upper border of the thyroid cartilage. The external jugular vein is cut between two clamps and tied. All soft tissues are dissected from the mastoid process except the insertion of the fibers of the sterno-cleido-mastoid.

The tip of the process with the muscular fibers inserted is now detached either with a chisel and mallet or a Gigli saw passed beneath the muscle. Care must be taken not to injure the facial nerve. The mastoid tip with the muscle inserted is now swung backward. Beneath is seen an almost transverse fleshy mass emerging behind the mastoid process and passing beneath the ascending ramus of the mandible. This is the posterior belly of the digastric, which hides the vascular sheath in this region. This muscle is isolated, detached from the deep plane, and carefully sectioned perpendicularly to its fibers. By blunt dissection the various vessels and nerves of the region can now be isolated.

In restoring the parts to normal, the digastric is reunited with two catgut sutures. The detached mastoid tip is replaced and fixed by a few sutures through the periosteum and overlying fibrous tissue.

These various procedures are well illustrated throughout by H. Beaufour. R. H. Ivy.

Cannon, W. B., Fraser, J., and Cowell, E. M.: *The Preventive Treatment of Wound Shock.* *J. Am. M. Ass.*, 1918, lxx, 618.

In previous papers of this series, evidence has been afforded, among others, on the following points:

1. Cooling of a person in shock is attended by a further lowering of an already low blood-pressure or by continuance of the pressure at a low level.

2. Surgical operation performed on a person in shock is accompanied by a rapid and large increase of an acidosis which is already present, and by a correspondingly sudden and extensive fall in an existent low arterial pressure.



In the following account are presented suggestions based on preceding papers for the prevention and early treatment of wound shock and for the preparation of the wounded man for surgical operation.

To send blankets to all parts of the line is impossible, but by the adoption of a waterproof sheet-blanket "packet" system a stretcher prepared for use is provided with means for preventing excessive loss of body heat.

All regimental stretchers at advanced bearer posts in the front line and stretchers carried by working parties should be equipped with this packet. The wounded man should be guarded as much as possible against loss of heat. Efficient first aid should be given rapidly without unduly exposing the patient to the cold for a prolonged period. A hot drink should be given at the earliest possible moment. Then, having been carefully wrapped up, the patient should be carried down with all speed to the regimental aid post. A well trained, intelligent orderly might be entrusted to give a tablet of morphine (one-fourth of a grain) by mouth in cases of severe pain.

As soon as the patient arrives at the regimental aid post he should be given a few ounces of hot drink, and his wet boots and puttees removed, along with any other clothing which may cover wounds. Meanwhile the dry stretcher is prepared by arranging the first two blankets so that four folds will come underneath the patient. The blankets are covered temporarily with a water-proof sheet to prevent soiling while wounds are being dressed. The man is now transferred to this prepared stretcher which is supported on trestles and stands well over the stove. The third or free fold of each of the lower two blankets hangs down on either side and helps to form an enclosed warming chamber. If there is no constant source of heat, a hot air chamber may be made in a few minutes by use of a Primus or Beatrice stove.

The patient is now becoming warmed, while the medical officer is attending to the surgical cleansing of the wounds and neighboring parts, and is applying proper dressings and splints. As soon as the dressings are finished, well guarded hot water bottles are placed in each axilla and a third across the loins or between the legs; and the third blanket, which is doubled lengthwise, is laid over the patient. The two warmed blankets which have been hanging to form the sides of the hot air chamber are lifted, carried over the patient and tucked in.

Finally, just before the patient is sent off, he is given a hot drink of sweetened tea in which a dram of sodium bicarbonate is dissolved.

At the advanced dressing station the sweetened alkaline drink and warming process with the Primus stove may be repeated.

The next stage of the journey is usually undertaken by means of some mechanical transport, such as a narrow gauge railway or a motor ambulance. The cars are at present warmed, so that there

is a lessened chance of loss of body heat on the final stages of the journey.

At the clearing station, application of warmth should be emphasized as the most important part of the treatment in all serious cases.

Whereas the appearance and degree of primary wound shock depend on the degree of damage done to a vital organ, secondary wound shock is proportionate to the length of time the pernicious factors are allowed to work; in other words, to the period when the wounded man is "lying out."

In the rush of dealing with large numbers, it will be impossible in the line to attend to all the details described above. Large drafts of hot sweet tea made alkaline with sodium bicarbonate can, however, be easily provided, and should be given whenever the shocked patient complains of thirst at the dressing station or at any other suitable point on the way down to the clearing station.

Evidence presented in an earlier paper showed that the acidosis which prevails in cases of low blood-pressure is associated with such sensitization of the body that surgical operation may result in a serious increase in the acidosis and a perilous sinking of the blood-pressure. The question as to the causal relation between low pressure and acidosis has been discussed, and it appears that the two conditions may interact, each contributing to the development of the other.

Under these circumstances, advantage would be gained by protection against each of the conditions: first, against the development of the sensitizing acidosis; and secondly, against the increase of acidosis and the further fall of blood-pressure which occur at operation.

The results obtained by others show that by administration of sodium bicarbonate, the alkaline reserves of the body can be greatly increased even in unfavorable circumstances. Since acidosis develops in shock and involves a definite risk when operation is undertaken, its avoidance should be sought. The recommendation is offered that wounded men be provided with a warm drink containing a dram or four grains of sodium bicarbonate at suitable relay posts on their way from the front to casualty clearing stations, as previously indicated.

The authors cite six cases, among others, which show that an alkaline injection at the start of anæsthesia prevents the dangerous depressive effects which the anæsthetic and operative procedures have in cases of shock with acidosis. The operation ends, not with an increase of the existent acidosis, but with the acidosis overcome and a normal alkaline reserve provided. And the blood-pressure, instead of being perilously lowered, is actually raised during the critical period. The blood-pressure may fall to some extent later, but the improved state of the patient during operation is unmistakable, and the subsequent course of shock cases in which operation has been performed with the precautions described above has been highly gratifying.

E. C. ROBITSHEK.

## ASEPTIC AND ANTISEPTIC SURGERY

Fiessinger, N., and Clogne, R.: **Biological Study of the Action of Alkaline Hypochlorites in the Treatment of War Wounds** (Etude biologique sur l'action des hypochlorites alcalins en solution dans le traitement des plaies de guerre). *Rev. de chir., Par.*, 1917, liii, 264.

The authors remark that the Carrel method of treating wounds has arrived at that stage when the facts can be viewed with a certain amount of perspective. The clinical facts show incontestable successes, which fully justify its employment. But regarding the deductions from the application of this method, especially the idea that Dakin's fluid acts as an energetic sterilizer in war wounds, the authors disagree. In this article they demonstrate that in ear wounds hypochlorites in the dosage actually employed at present have only a very slight sterilizing action, but that they act energetically as chemical cleansing agents by proteolysis.

The authors have made a number of bacteriological and chemical studies, of which they give the details. In general they find that a wound remains the site of an anaerobic infection so long as any mortifying tissue remains in it, and of a more or less aerobic infection as long as any exudation whatever remains, in spite of continuous Carrel irrigation. A wound irrigated by the Carrel method preserves a microbic septicity, the character of which varies according to the perfection of the chemical purification; but that no direct germicidal action truly exists.

The authors' experiments have shown them that *in vitro* unquestionably hypochlorites have an antiseptic action; but it is otherwise in the presence of liquids or solid albumins. Hypochlorites decompose in the presence of proteins and they only act on living microbic elements, either by their great abundance or because the small quantity of albumin present leaves enough non-decomposed hypochlorites free to act.

The excellent appearance of a wound and the facility of its early secondary suture when treated by the Carrel method cannot, according to the authors, be attributed to any particular sterilizing action, but rather to a combination of favorable chemical actions, especially to the proteolytic action of the hypochlorites. A series of experiments along these lines brings them to the view that the action of alkaline hypochlorites on albumin may be thus summarized: A hypochlorite is decomposed by contact with albumin; the chlorine combines with a certain part of the proteins and gives rise to chloramines; oxidation phenomena follow. The sum total of these complex actions is a dissociation of the albuminoid molecule into albumoses, peptones and still simpler products. There is in fact a proteolysis of chemical origin. This rapid dissociation of hypochlorites in the presence of albumin explains the exhaustion of their antiseptic action.

A constant renewal is necessary in practice. The cleansing of the wound is however not due to any anti-microbic action.

The general conclusions drawn by the authors from their study are:

1. Dakin's fluid has in reality only a weak germicidal power which is lowered according as the sphere of operation increases in albumin contents.
2. At the muscular surface and in war wounds, continuous Dakin irrigation does not effect sterilization in the doses actually employed.
3. The improvement of wounds by the Carrel treatment is due to its proteolyzing action rather than to its sterilizing action. W. A. BRENNAN.

Taylor, W. H., and Taylor, N. B.: **Liquid-Tight Closure and the Treatment of Wounds.** *Lancet*, Lond., 1918, cxciv, 671.

In the *Lancet* of September 22, 1917, a device was described for water-tight irrigation of wounds. This device as improved is described and illustrated in this article. It is a rubber contrivance which is held in position by a roller or many-tailed bandage. There is an outlet and an inlet for irrigation purposes. There are lips of rubber at the upper and lower ends of the device which, when the appliance is filled with liquid, make it water-tight. No drainage tubes are used in the wound but small wire "cages" are used to spread it. The center of the device coincides roughly with the center of the wound and the bandage applied.

An irrigator holding three to six quarts is used with one-fourth of an inch tube connection. The out-flow tube is larger and has a pinch-off attachment. The pressure is regulated by the height of the irrigator. The elevation is slight (6 inches) in the acute cases and where there is much discharge. The highest elevation is about eighteen inches. As much as three feet elevation has been used without untoward effects. In the use of negative pressure more care must be exercised. Freedom from pain is the best criterion as to the amount of negative pressure to use. Five per cent saline at 115° F. is used as an irrigation solution.

The results may be noted as follows:

1. Rapid softening of indurated tissues and return to normal color.
2. Disappearance, often within twenty-four hours, of the swelling.
3. Profuse discharge of pus for the first twelve hours, and rapid diminution afterward, the secretion becoming seropurulent, then lymphoid in character.
4. On an average, in chronic cases, the wound is cleansed of pus in thirty-six hours; i.e., pus is removed as soon as formed.
5. Granulations become bright in color and bleed more readily. After four or five days if the device be removed, an old chronic sinus usually fills up with lymph and blood.
6. There is almost instant relief from boring pain which may have worried the patient for months.



7. The improvement in general health and morale of the patient incident to these local changes is often remarkable.

The following advantages, it is believed, are associated with this plan of treatment:

1. Penetration of the fluid to, and tidal evacuation of, distant loculi, resulting in thorough mechanical cleansing of the wound cavity.

2. Establishment during negative pressure of the outward flow of lymph with presumably its quota of bacteria.

3. Avoidance of large mutilating incisions required for evacuation of deep pockets and insertion of fluid-conducting tubes.

4. The concentration of antiseptic or hypertonic fluid remains constant, since the freedom of its delivery into the wound being unrestricted, the solution can be frequently renewed.

5. The ease with which the beneficial effects of heat on interior of the wound may be secured.

6. Elimination to a large extent of the personal equation.

7. Insurance of dry beds and a sense of comfort to the patient, who is enabled in many instances to be out of bed while undergoing treatment.

8. Economy in time, effort, and material.

9. Presumed adaptability of its use to dressing stations and ambulance trains. CARL R. STEINKE.

**Phocas: Early and Total Discontinuance of Dressings in Surgical Wounds** (De la suppression hâtive et de la suppression totale du pansement dans les plaies chirurgicales). *Bull. et mém. Soc. de chir. de Par.*, 1918, xlv, 329.

Phocas reports the results obtained in 73 operations in which dressings were not used in the surgical wounds united by first intention.

The method was first tried out in small wounds of from 3 to 5 cm. without drainage. The practice was then extended to larger wounds, appendiceal, hernial, etc., and finally to the extensive incisions of large abdominal laparotomies, limb wounds, and breast excisions treated in the civil hospitals.

The technique after operation was as follows: After careful catgut sutures of the deep layers the wound was flooded with ether and correct suture by layers was then done. The lips of the wound were united with close stitches, the knots being tied lateral to the wound. The neighborhood of the wound was washed with ether, but not the wound itself, in order to allow coagulation of the drops of blood made by the Reverdin needle. No compressive or irritating dressing whatever was put on the wound, but a piece of sterilized linen was fixed to the patient's shirt so as to preserve the wound from any contamination. By the following day the blood coagulum formed a blackish interrupted crust over the wound.

There may be a slight reddening along the wound. If there is slight infection a yellowish crust forms, but it is rare. There is usually no swelling. The course is simple. Some of the sutures

are drawn by the fifth day and the rest by the eighth or ninth.

The 73 wounds thus treated include 13 appendicectomies, 17 herniæ with appendicectomies, 14 simple herniæ, 12 hysterectomies, and 1 breast excision. In this series there were 3 deaths but they were in no way due to the method because the wound was in all cases as firmly united as if it had been classically dressed.

Complete rupture of the wound is very rare. It was observed twice, but these cases were cured. Even in the most violent fits of coughing and vomiting the author has never observed rupture.

The author thinks that the protective rôle of dressings has been exaggerated. That the ordinary dressing protects a wound against infection is possible; but in the absence of a dressing the wound protects itself by the coagulum formed. This is a spontaneous dressing practically aseptic and affords sufficient security. The same cannot be said of the classical dressing which by depriving the wound of air and light creates a temperature suitable for development of pathogenic microbes, macerates the skin, and when it is badly done may itself be a cause of infection. Exposure to the air renders the wound painless more rapidly, and cicatrization is earlier.

According to the author's observations, the laparotomized fare best under this method. From the second day they feel comfortable, emissions of gas are easy, the abdomen is supple, and a slight ballooning does not produce the same distress as it does in a patient enclosed in a compressing bandage. Experience has also shown that the protective rôle of the dressing with regard to involuntary movements is of little importance.

The discontinuance of dressings according to the author is the result of a natural evolution in the treatment of wounds toward which there has been a trend since the antiseptic methods of Lister.

W. A. BRENNAN.

**Morison, A. E.: Incarcerated Sepsis.** *Lancet*, Lond., 1918, cxciv, 535.

All surgeons meet with cases where, as a result of slight trauma to a previously infected part, there has been lighted up an infection after the primary lesion had apparently soundly healed. Few war wounds pursue an aseptic course, and many, after having healed for a considerable time, break down and discharge pus. Moreover, some wounds have been soundly healed for months but as soon as an operation is performed the surgeon is disappointed to find that in a day or two the patient's temperature rises, he complains of pain in the operation area, and the wound is found inflamed and soon begins to discharge pus.

These cases occur where the probability of reinfection of the wound from without may be excluded and the only explanation that can be offered is that during the healing process organisms have become incarcerated in the deeper scar tissue of the wound and have been set free by operation.

In the course of operations it may be evident that small foci of incarcerated pus or granulation tissue containing active organisms threaten the result, and in spite of attempts to sterilize the areas with a powerful antiseptic, infection of the wound may follow.

A further result of the continual irritation caused by the presence of incarcerated organisms may be that a hard, dense scar is produced which causes pressure on underlying structures or it interferes with the free movement of joints or muscles. In the case of bone injuries, a dense osteosclerosis is set up around such an infective focus, and when any strain is put on the part, an aching pain, tenderness of bone, and constitutional disturbances may be produced.

For the past two years the author has made it a part of the routine preparation of cases previously wounded but now healed, before operation to order that the seat of injury be treated for a week or ten days with radiant-heat baths, from 150° to 250° F. for ten minutes daily. If incarcerated sepsis is present, the scar in two or three days becomes inflamed, fluctuation occurs, and as a rule, a small quantity of pus is evacuated. The wound is then encouraged to heal, and after healing, in a period of time varying from two weeks to three months, a further course of radiant heat is ordered. If no reaction occurs within a week, the operation may be safely proceeded with so far as any danger of buried sepsis is concerned. In no case of the author's in which this preliminary treatment has been carried out has there been failure with a rigid aseptic technique. The scars become more healthy, thinner, more mobile and elastic.

V. C. HUNT.

### ANÆSTHETICS

Gwathmey, J. T., and Karsner, H. T.: *General Analgesia by Oral Administration. Brit. M. J.*, 1918, i, 254.

This report is in the nature of a preliminary communication based on animal experiments and a sufficient number of clinical cases to support the conclusions of the animal work. It will be seen that general analgesia in which there is loss of sensation, with or without loss of consciousness, can be established for otherwise painful dressings or for short operations.

It is possible to administer the analgesic by mouth with perfect safety and it is applicable to all forms of painful dressings and is being developed to embrace such as resection of a rib, removal of a foreign body, etc.

Rabbits were selected for the preliminary work. The various substances were given by the stomach tube, the animals immediately released and observed. Quinine and urea hydrochloride, trional, morphine tartrate, paraldehyde, ether in olive oil, and other combinations were tried to determine whether analgesia could be produced by oral administration of proper agents. Various combina-

tions of drugs were not very successful, and in rabbits the best results were obtained by the use of ether in oil. After these experiments it was considered safe to proceed with the investigation in man.

To administer the analgesia to man, it was given with port wine, which was found to be the best mixture. One ounce of port wine is placed in a glass and the analgesia in another glass. The patient takes a mouthful of wine and holds it for thirty seconds before swallowing. The ether mixture is then taken and followed immediately by the remainder of the wine. Numerous patients have taken it with excellent results. Only one patient has been nauseated. All of the cases have been able to take food and water shortly afterward, and even in patients much exhausted by infection there have been no deleterious effects. The ether mixture usually given was according to the following formula: ether and liquid paraffin, four fluid drachms of each, peppermint water, five minims.

The authors state that 50 per cent ether in liquid paraffin or other bland oil is probably the softest general analgesia, having apparently no deleterious effect upon the stomach, and is not followed by nausea and vomiting.

V. C. HUNT.

### SURGICAL INSTRUMENTS AND APPARATUS

Pearson, W.: *Splints for Use in Arm, Ankle, and Leg Injuries, with Some Observations on Treatment. Lancet, Lond.*, 1918, cxiv, 670.

The right angle arm splint is of the Thomas pattern bent laterally to a right angle at the elbow. Extension or fixation is applied to the arm below the wound by means of lateral strips of adhesive plaster, or preferably by means of folded strips of gauze fixed with glue. It is applicable to both right and left arms, but must be stocked in two or three sizes as regards the length of the upper arm segment.

The ankle and leg splint is of light metal framework two feet long of one-quarter inch round iron bent up at the foot end long enough to suspend the foot, and at the upper end bent up enough to arch over the thigh. The leg is suspended between the two side bars hammock-fashion. Better results are obtained with much less difficulty and with greatly increased comfort of the patients.

CARL R. STEINKE.

Crile, D. W.: *An Abduction Splint for the Femur. Brit. M. J.*, 1918, i, 476.

The war has demonstrated that for the early treatment and transportation of patients with fractures of the femur, Thomas' knee splint is the best general utility splint.

However, fractures in the upper third of the femur when accompanied by extensive flesh wounds of the buttocks and hips present great difficulty to treatment with the Thomas splint, for these cases require abduction as well as extension, and their wounds should be available for dressing.



Because there was no splint meeting those requirements, the author has devised one which has proved satisfactory in his hands, and which is based upon the lines of the Thomas. The Thomas ring is transposed to the uninjured thigh, producing a base for extension against the ischial tuberosity on the sound side of the pelvis. Coming from this ring is the inner rod of the splint which is continued, as in the Thomas, into the outer rod which fastens to an iliac pad. This pad fits just below and parallel to the crest of the ileum on the same side as the fractured limb. The pad is continued into a broad band which passes around behind the pelvis and fits snugly to the hollow of the sacrum. In front the iliac pad and the ring are connected by an iron rod running transversely across the body. This is

adjustable for width to fit any body. The band which passes around the back buckles to this transverse bar in front.

This splint is applicable to any case in which abduction is required, produces a maximum true abduction angle of 45 degrees, and can be adjusted to any lesser angle. The absence of the ring on the wounded thigh leaves space for dressings. The splint permits the patient considerable movement in bed.

Fixed extension can be changed to weight and pulley extension when desired. Flexion at the hip can be obtained by bending the splint or by elevating the foot as with a Thomas. The author has seen no tendency to scoliosis to persist after the splint is removed.

V. C. HUNT.

## SURGERY OF THE HEAD AND NECK

### HEAD

**Speed, K.: Gunshots of the Head, with Especial Reference to Indications for Operation and Technique; Demonstration of Cases.** *Surg. Clin. Chicago*, 1918, ii, 79.

Speed presents a very interesting treatise on the methods of handling gunshots of the head that occur in the present war.

He classifies gunshot wounds of the head into (a) non-penetrating, of the dura and brain, skull damage acknowledged; (b) penetrating brain wounds. As the basis for operation must be a pathologic one, he has made a working pathologic analysis of war wounds of the head as follows:

1. Mechanical pathology of gunshots.
2. Bacteriologic pathology, usually secondary.

The mechanical pathology concerns largely the patients who are received a short time after injury, and is of greater interest because bacterial action has not yet entered as a factor. The factors which are present and must be considered are shock or concussion, hæmorrhage, mechanical injury of vital portions of the brain and tissues about or remote from the missile tract, and finally the presence or absence of foreign bodies. Speed does not agree with Cushing's statement that after excising scalp wounds and removing depressed or damaged bone, one should proceed to open the dura when subdural hæmorrhage or cortical contusion is suspected, even though that membrane be intact. He does not believe that this should be done in operative work in the face of gunshot wounds and latent infection. He says that at the time of the Somme push last year many cases of head injuries came into his wards on which there was not time to operate, and after balancing up statistics some weeks later, he found that the mortality among unoperated patients, even in those in which scalp incisions were not practised and foreign bodies lay in the brain, was decidedly lower. He cites the investiga-

tions of Lieutenant-Colonel Warren, who followed over 1,200 patients from France to England and most closely recorded the results in at least 600 of them, concluding that many head operations in France were worse than useless and that many patients did better without operation because in that way they avoided hernia cerebri.

Speed believes that in wounds of the skull in which the dura does not seriously lose continuity and the brain is not penetrated, the subdural clots will be absorbed just as blood extravasations are elsewhere in the body and that there is no reason for opening the dura and washing out these clots.

He cites a case illustrating the reversion of the bullet that takes place in penetrating wounds of the head. In this case the bullet entered in the parietal region and passed down and forward, coming to lie just behind the right orbit. The roentgenogram shows that the bullet is completely reversed and the nose of bullet points exactly backward toward the wound of entrance. In every penetration where the bullet remains in the skull it tumbles just once and no more. If the velocity is high enough one may expect a through-and-through wound, but in bullets which are partly spent and are destined to stop within the skull, the tumbling occurs. This is explained by the fact that resistance of the lighter nose of the bullet tends to retard it and turn it down. The momentum of the heavier and bulkier body behind crowds it forward until it swings in a circle, and the heavier end finally comes around to lie in front as the missile travels on. For surgical pathology this has a significance, because the track made by the bullet is not a simple penetration tunnel, but results in a broadened full-length-of-the-bullet-wide track. The great shock of tumbling and transmitted rotatory force lends to the gravity of these wounds, and one must conclude that clinically these patients are in grave condition and should not be subjected to additional shock, as from operation, until partially recovered.

In penetrating shrapnel wounds the bone shower into the brain is relatively greater, but the total brain damage is not so great on account of the lack of rotatory motion.

He reports two cases representing mechanical pathology. The first one had a through-and-through wound from one temporal region to the other, rather high up. The skull was torn widely open; both hemispheres of the brain were deeply guttered; the longitudinal sinus was obliterated. The wound was cleaned, irrigated, bone fragments removed, and the trimmed scalp sutured over a drain of paraffin gauze. The patient apparently recovered from the effects of the operation, but died later.

In the second case the missile entered behind the orbit, traversed the front of the skull, and made exit behind the other orbit, fracturing the ethmoid, nasal, and frontal bones, and opening the base of the frontal fossa into which a finger could be passed. The brain was not lacerated, but every trace of ocular tissue had to be removed, so the patient is permanently blind. This patient made a good recovery and was sent to the base with every promise of remaining permanently well.

He says that many small or deep-lying foreign bodies do not demand removal. Cushing believes that bone fragments cause more irritation intracranially than metal, because the latter are of themselves slightly antiseptic. Speed believes on theoretic grounds and from clinical observation that the well-vascularized brain might be supposed to absorb in recovery small bone fragments deprived of their normal blood-supply, just as bone transplanted and finding no physiologic functional demand is absorbed elsewhere in the human body. Probably metal and bone are fairly negligible as bacteria carriers; rather must be considered the dirty scalp, hair, cloth, and other substances carried in, usually on the metal. Hence the practice to "get the metal." All these bodies require irrigation and removal if possible. Metal from shells is sterilized by the heat of fire; human skull bone is reasonably sterile, but the contamination comes from the external human tissues and clothing.

G. W. HOCHREIN.

**Janeway, H. H.: Treatment of Cancer of the Lip by Radium; a Report of 24 Cases. *J. Am. M. Ass.*, 1918, lxx, 1051.**

The exposed position of epithelioma of the lip renders it particularly favorable for successful treatment. Advice is sought earlier, as a rule, than in cancerous conditions elsewhere.

The lip is a favorable site for the treatment of epithelioma by radium. The rapidity of growth and size of the lesion are more important as determining the prognosis and malignancy than is the duration of the disease before treatment. Suddenly increased activity probably marks the transition between the localized cancerous stage and true infiltrating cancer.

Radium therapy saves the patient unnecessary

sacrifice of large amounts of healthy tissue, and does not incur the danger arising from excising tissue too near the margin of the disease.

Considering the lymphatic extension as embolic in its nature, the author believes that the cervical lymph-nodes perform for a time a conservative function, and that early dissection, which involves some normal lymphatic tissue, may do harm.

When lymphatic vessels are incised, the prophylactic measure of placing radium in the wound against the vessel stumps is recommended.

From a review of his reported series of cases, the author recommends the use of radium in operable cancer of the lip; and that lymph-nodes be watched for metastatic development, and that such nodes be removed, and the wound treated with radium, at the time of operation.

The use of radium emanation instead of radium element is approved because of greater ease in obtaining uniform distribution. V. E. DUDMAN.

**Gatewood, L.: Radical Surgery of the Maxillary Antrum with Conductive or Perineural Anæsthesia. *Internat. J. Surg.*, 1918, xxxi, 94.**

A careful study of the anatomy of this region with especial attention to the relations of the infra-orbital and posterior superior dental nerves shows the feasibility of anesthetizing these nerves by the injection of a local anæsthetic into the vicinity of their trunks.

The technique for blocking these trunks is simple, once a clear understanding of the anatomy is attained; and the advantages of this method are: (a) Less anæsthetic is required by the conductive method; (b) anæsthesia is produced with less pain; (c) the duration of the anæsthesia is greater; (d) less trauma is produced and the danger of infection is not so great.

Novocaine is the anæsthetic of choice in this connection, 2 ccm. of a two per cent solution being used. P. G. SKILLERN, JR.

**Judd, E. S., New, G. B., and Mann, F. C.: The Effect of Trauma upon the Laryngeal Nerves. *Ann. Surg.*, Phila., 1918, lxvii, 257.**

To determine the cause of such paralyses as are sometimes seen following thyroidectomy, the authors undertook a series of traumatic procedures on the recurrent laryngeals in dogs. All operations were done under ether anæsthesia and sterile technique. The function of the vocal cords was observed by direct laryngoscopy without an anæsthetic and the results noted without the observer knowing what operation had been performed or what his results were in previous observations.

From these experiments it seems that section of the recurrent laryngeal nerve produces complete paralysis of the vocal cord of the corresponding side which in all probability is permanent. Ligation of the recurrent laryngeal nerve with linen or catgut produces complete and probably permanent paralysis of the vocal cord on the corresponding side.



Stretching the nerve in a manner similar to but of longer duration and greater intensity than that occurring in operation does not impair the function of the vocal cord. Stretching for a long period, as over muscles, impairs the function of the vocal cords, but this impairment is probably due to trauma rather than to the stretching. Pinching the nerves with a hæmostat in a manner similar to that which may occur in an operation produces temporary paralysis, but restoration of function always occurs, the length of time depending upon the anatomical point at which the nerve was crushed.

The time found necessary for complete regeneration of the nerve when injured in the areas usually traumatized by operation varies from thirty to sixty days. Exploration of the nerves produces an effect on the vocal cords depending on the amount of trauma to which the nerves are subjected. Careful dissection will probably have no effect provided there has been no trauma. GATEWOOD.

**Sharpe, W.: Fractures of the Skull; the Resulting Intracranial Pathology and the Treatment.**  
*Med. & Surg.*, 1918, ii, 319.

The pathology of traumatic cerebral oedema may be similar to a localized traumatic oedema such as occurs elsewhere in the body. In head injuries, as in concussion, there is increase of intracranial pressure which may be recognized by the ophthalmoscopic examination of the fundi, and by measurement of the pressure of the cerebrospinal fluid at lumbar puncture by means of the spinal mercurial manometer, which test reveals in such cases a marked increase in the amount of fluid in the central nervous system. This increased amount of the fluid is subarachnoidal and its source undetermined, but the author's impression is that cerebral oedema results from an increase in the amount of cerebrospinal fluid secreted by the choroid plexus chiefly, and also from the partial blockage of the excretion of cerebrospinal fluid due to congestion and a temporary retardation of the flow of blood in the cortical veins and the sinuses.

As to the diagnosis of brain injuries, the clinical signs and symptoms are confusing as in many cases the more extensive the fracture, the less seriously is the brain injured, and the most dangerous of brain injuries may not even be associated with fracture of the skull. The most important factor to be determined is the presence or absence of an increased intracranial pressure. In treating 239 adult patients having acute brain injuries, only 79 or 34 per cent showed increased intracranial pressure and were operated upon. The remaining 160 were treated by the expectant palliative methods of absolute quiet, ice helmet, and catharsis. A definite diagnosis should be made early and patients should not be allowed to develop definite paralysis, a low pulse-rate, Cheyne-Stokes respiration, etc., symptoms of resulting medullary compression.

In head injuries the symptoms of shock are usually the first to appear and the usual treatment

for shock should be instituted. Intracranial pressure symptoms appear about six hours after the head injury. As the patient recovers from the condition of extreme shock, the blood-pressure will rise and the signs of intracranial pressure become manifest. Repeated ophthalmoscopic examinations of the fundi should be made to determine the earliest signs of pressure. In the early stages of pressure there will be a dilatation of the retinal veins and an oedematous blurring of the nasal halves of the fundi. Later when the pressure becomes still higher the temporal halves of the optic discs will become obscured. The ophthalmoscopic examination should be supplemented by a measurement of the pressure of the cerebrospinal fluid at lumbar puncture with the spinal mercurial manometer. The normal pressure is 5 to 9 mm. of mercury, so that if a pressure higher than 15 mm. is obtained, it may be concluded that the ophthalmoscopic findings are confirmed.

If the traumatic intracranial pressure is mild, the convalescence can frequently be shortened, the headaches be relieved, and the general condition of the patient greatly improved by one or more lumbar punctures. This practice should never be instituted in a patient with high intracranial pressure or in subtentorial lesions for fear of consequent medullary compression in the foramen magnum.

The two periods in which an operation is distinctly contra-indicated in cases of brain injury are: first, the condition of shock in the very beginning; and second, the condition of medullary collapse. Cases of depressed fracture of the vault should, of course, always be elevated or removed. If these two extremes can be avoided, the rational operative treatment should depend upon the presence or absence of an increase in the intracranial pressure whether there is a fracture of the skull or not. Even the X-ray, though important, should never be allowed to delay the operative procedure. Many cases of head injuries at autopsy have revealed no hæmorrhage at all, merely a "wet," oedematous, swollen brain but sufficient to cause medullary compression and the death of the patient.

The operation of choice, where operative procedure is indicated, is the subtemporal decompression and drainage. In the absence of localizing signs, the decompression should always be performed on the right side in right-handed patients, as the motor speech area of such is in the left cerebral cortex. This route exposes first the silent area (temporo-sphenoidal lobe); second, the middle meningeal artery and that portion of the skull so frequently exposed to fracture; third, the middle fossa of the skull, the chief intracranial cistern, at its lowest point; fourth, the squamous portion of the temporal bone, the thinness of which makes the operation less difficult.

If the intracranial pressure is so high that the cerebral cortex tends to protrude through the bony opening made, it is frequently wiser in selected cases to perform a similar operation upon the opposite



side of the head. It may in some cases, however, be best to wait one or two days for the second operation. In 5 per cent of the total patients operated upon, this was done. Rubber tissue drains are removed the first or second day. The patient should not be allowed to return to active life for several months following the operation, and repeated ophthalmoscopic examinations should be made of the fundi of the eyes to rule out a persistence or recurrence of the intracranial pressure.

P. W. SWEET.

**Walthal, D. O.: Recovery of a Case of Purulent Meningitis Complicating Mastoiditis.** *J. Mich. St. M. Soc.*, 1918, xvii, 102.

The case reported is of a child seven years old who developed a mastoiditis which spread through the petrous portion of the temporal bone and involved a small area of the dura, causing a purulent meningitis as shown by spinal puncture. The infected tissue was removed and the wound closed partially; the patient left the hospital.

Fourteen days later she developed fever and other signs of meningitis and returned to the hospital, when the wound opened and discharged very foul pus. The wound was irrigated with saline. It is closing, and the patient is afebrile and playing about the ward. The value of lumbar puncture as a means of early diagnosis and the necessity of early operation is emphasized. H. J. VAN DEN BERG.

**Gray, H. M. W.: Treatment of War Wounds of the Brain and Its Coverings at Casualty Clearing Stations.** *N. Y. M. J.*, 1918, cvii, 407, 457.

The objects of treatment can be shortly summed up as follows: (1) to prevent or remove infection, thereby preventing further destruction of tissue; (2) to establish diagnosis in some cases of doubt; (3) to remove all sources of irritation to the brain, if this can be done without causing further serious damage to it; (4) in any case to procure rapid healing of the superficial parts, provided that the brain is safe.

The author regrets that he has refrained from operation or has not operated sooner upon some patients who have done badly. In all injuries it is held that operation furnishes an additional and usually accurate means of diagnosing the extent of the lesion. In minor injuries it has done no harm, so far as can be ascertained, and it renders the patient fit to return to duty at a much earlier date than would otherwise be the case.

It is better to send a patient home with a healed scalp and healthy skull, inside which are the fewest possible potentialities for future brain trouble than that he should go with the prospect of a later operation on an area which is obscured by many abnormalities. If it can be shown that this is done with as great safety as attends more conservative methods, the procedure is more than justified. Sepsis and the exigencies of war will always make the proportion of failures a relatively high one.

On admission, the patient's hair should be shaved off or removed with a depilatory paste, the wound thoroughly examined (the use of a probe is deprecated), two roentgenograms taken in planes at right angles to each other, and a neurological examination made. An aperient should be given and the administration of urotropine, fifteen to twenty grains every three or four hours, begun. If the brain is injured, it is well if possible for future guidance to make a bacteriological examination of the discharge. If brain matter is exposed or exuding from the wound, operation should be carried out as soon as possible. In no case should operation be postponed for a longer period than a couple of days.

The majority of wounds of the scalp should be excised, and the bone beneath carefully examined. If no further interference is made, the wounds can be sutured, usually without drainage. The wound itself should be cauterized, or desiccated by thorough rubbing with five to ten per cent picric acid in spirits and drying with a swab. In practically all cases the area of operation can be covered in by healthy scalp by simple suture or by a plastic operation. Every case in which depressed fracture of the skull is suspected should be explored without undue delay, whether sepsis is present or not. If the edge of the wound is much inflamed and infiltrated, treatment with hypertonic saline applications or a paraffin paste usually makes it fit for excision in twenty-four to forty-eight hours.

The injury comes under one of the following varieties:

1. Cases without definite external signs of depressed fracture. Because fracture with displacement of the inner table or some other subcranial lesion may be present, it is important that operation should be carried out. If focal loss of function, even although evanescent, persistent headache, giddiness, or other more definite signs of cerebral compression are present, especially if optic neuritis co-exists, trephining should be done, even in the absence of definite laceration of the periosteum. If fracture of the outer table without depression is found, or even if the bone is merely bruised, a small trephine opening in the external table only should be made and the inner table examined.

2. Fracture with depression but without injury to the dura mater. The fractured and probably septic bone is excised either by making a very small trephine opening outside the soiled area and completing the removal with a skull-cutting forceps, e. g., DeVilbiss, just wide of the shattered bone, or by the nibbling method, using a properly devised small gouge forceps. If the dura is apparently normal and the brain pulsates well, the operation can then be completed by suture of the scalp with or without drainage. If, however, the dura is muddy-looking, if there is loss of pulsation and circumscribed loss of elasticity, especially if focal symptoms have been present after the wound was received, the dura should be opened.



3. Injury of the dura without foreign body or sepsis. Fracture with injury to the dura mater, when no foreign body is present and the wound in the brain probably aseptic occurs frequently. After excision, *en masse* as before, the scalp wound may be enlarged in any desired direction in order to procure adequate access. The bone around the fracture is cleared. The spicules are removed and the skull cut away carefully with forceps to an extent varying with the injury to the dura. A clear margin of one-third of an inch of uninjured dura should be exposed. Great care must be exercised to separate the dura from the bone while this is being done. Ragged edges of dura should be excised. If a track exists in the brain, this should be carefully explored, by the finger if possible, and any collection of pulped brain tissue allowed to escape. A drain of folded jaconet or small rubber tubing should reach from the opening in the dura through one end of the wound. It should be removed after twenty-four hours. If sepsis asserts itself, the wound should be freely opened up at once.

4. Injury to the dura complicated by a foreign body in the brain and by sepsis. The position of the foreign body is previously determined by X-rays. At the operation, as in type 3, the track through the brain matter can usually be explored by the index finger. The foreign body having been located, a suitable flat or slightly curved scoop is passed along the finger under the foreign body which is then pressed against the point of the finger, and all three are carefully and gently withdrawn. A foreign body or piece of bone may often be coaxed out by making very slight flexion movements with the distal phalanx of the examining finger. If the track will not admit the finger, the foreign body can usually be left with safety. A drain should be inserted in all cases, as already described. If definite sepsis is present, drains should be inserted in the track, leading straight out through the wound. In the worst cases the scalp wound should not be sutured until all danger has passed.

The author believes the exploration for foreign bodies by the finger at the primary operation is justified by the following considerations: (1) A track through brain substance is already present; (2) only very rarely is further injury to the brain caused by the procedure; (3) an abscess frequently develops if the foreign body is left in the brain; (4) if the wounds are large, sepsis has almost certainly penetrated along with, or following, the foreign bodies, and as has been said, the sooner they are dealt with, the better.

Operation in cases of fracture with injury to one of the blood sinuses may be difficult on account of the alarming hæmorrhage which may occur during the exposure of the sinus. The results of such operations have been very favorable. It has been found that practically all cases which survive the immediate effects of the injury are amenable to treatment by the application under light pressure of a piece of aponeurosis cut from the edge of the

scalp wound or from the fascia lata of the thigh. The procedure is known as the "postage stamp" operation.

The graft should always be covered by scalp at the end of the operation. In these cases it is practically always possible to suture the scalp wound completely, a small soft drain being inserted close to but not on the graft, and withdrawn in a day or two.

Lumbar puncture has frequently been found to give relief in cases of local circulatory disturbance after operation, evidenced, for example, by persistent headache, recurring focal muscular spasms, or slight hernia cerebri. The amount of cerebrospinal fluid withdrawn varies with the pressure of the fluid. It is rarely necessary to remove more than 25 ccm. The process may be repeated several times if thought advisable. It ought to be resorted to before any marked signs occur.

The wound should always be exposed for inspection when lumbar puncture is done, because this may cause the herniated brain to sink back to a considerable depth and protective adhesions may be torn. If lumbar puncture fails to alleviate the condition, a contralateral decompression operation may be tried. The free application of "bipp" has been found of great value in many cases. In most cases of hernia cerebri it will be found that posture has a marked effect, the protrusion being lessened when the patient is propped up in the Fowler position. This position should be adopted immediately after operation. A smart intestinal purgative is also sometimes effective. It is not advisable to make lumbar puncture in the early stages after a wound of the brain has been caused, unless the dura is intact, or until the exact local conditions have been revealed by operation.

In the great majority of cases the elliptical wounds resulting from excision can be closed, owing to the mobility of the scalp, if all layer sutures are used with superficial sutures between. It is well to work from each end in tying the sutures. In cases where complete closure cannot be obtained by this method, one must not hesitate to use plastic means, to which the scalp is particularly adaptable. A successful and widely used method is by extension of the original incision to form a large U- or S-flap. The ends of the wounds may be sutured to reduce the amount of plastic necessary. The scalp is undermined to any desired extent. When fully sutured there should be little tension; if there is much, the scalp should be scarified repeatedly between the sutures, sufficiently to draw blood. The line of sutures lies frequently completely to one side of the wound in the dura. Thus this method has an advantage over that of turning down a flap, and is no more elaborate.

The operation necessary in the majority of head injuries is a comparatively simple one. If preceded by infiltration of the scalp with local anæsthetic and adrenalin, hæmorrhage and shock are obviated to a very great extent and the operation made even



more simple. The dangerous hæmorrhage which may occur from large flap incisions is entirely prevented by this infiltration of the incision area with adrenalin solution, and, if some local anæsthetic has been added, the amount of general anæsthetic required is negligible. All serious cases should be kept at the casualty clearing station for two or three weeks after operation, and even longer if one is not quite satisfied with their condition.

E. C. ROBITSHEK.

**Cushing, H.:** *Study of a Series of Wounds Involving the Brain and Its Enveloping Structures.* *Brit. J. Surg.*, 1918, v, 558.

In this article Cushing gives in detail the results of the study of end-results in a consecutive series of 250 head injuries observed during the past three years. He states that there is less unanimity of opinion as to the treatment of craniocerebral injuries than of any other type of wounds. In a previous report on 219 cases in the *British Medical Journal* of February 23, 1918, he has already called attention to a method of treating penetrating wounds which had lowered the mortality from 54.5 to 28.8 per cent. The essential features of this method were the removal *en bloc* of the area of bony involvement, the withdrawal by suction through a soft catheter of the devitalized cerebral tissue lining the track without enlargement of the dural opening, and the extraction of bone fragments with the least possible increase in the trauma already produced.

Their early cases, under a general anæsthetic with flap exposures and imperfect cleansing of the track, did very badly and the mortality, usually due to infection, ranged between 50 and 60 per cent. To the victim of the injury, the injury to the brain is of far more importance than that of the skull. In this paper Cushing grades the cases according to their severity.

The chief elements to be considered in all of these grades are (a) the question of dural penetration; (b) the cerebral extrusion (*hernia cerebri*); (c) the penetration of the ventricles; and (d) the opening of portals of infection through the nose and inner ear. A detailed consideration follows:

**Group 1. Wounds of the scalp.** There is a tendency to underestimate these and to forget that one can readily overlook a fracture of the skull even if there is sufficient time to have an X-ray taken, because a slightly depressed fracture often fails to show in a lateral view. Again one must remember that an intact external table may conceal an injury of the internal table with serious cerebral contusions due to penetration of fragments. An instructive case of this kind is described and most excellently illustrated. Some of the very serious scalp wounds were produced by the missile penetrating the helmet, as a result of which portions of the metal entered the scalp and skull.

**Group 2. Local fractures with intact dura with or without cerebral contusion.** There are two types:

(a) in which the external table is practically intact with or without a verified depression of the inner table. In this sub-group, trephining must rest on one's judgment in the individual case, while in the second or subgroup (b), where there is a depression of both tables, trephining is invariably indicated even in the absence of neurological symptoms.

The widespread impression that one should never open the intact dura is born of early experiences in the war when the technique was less perfect. Unless the external wound is very septic, no risk is run provided it is closed immediately with delicate silk sutures. Even the pericranium may be uninjured and conceal a fracture. Whenever the neurological symptoms indicate a contusion, an exploration even in the presence of an intact dura, if it can be done with reasonable safety, will hasten the convalescence and restoration of function as the result of the removal of the devitalized cerebral tissue.

**Group 3. Wounds with local depressed fractures, laceration of the dura and cerebral contusion.** The prognosis is good because extrusion of the brain is prevented in these cases by the depressed fragments, hence there is no immediate risk of intracranial infection. Usually both tables are depressed but the bone may be only fissured or scored or even intact. Occipital cases do not do as well after operation as frontal ones because the latter are more accessible. Block trephining is to be preferred to the more common method of removal piece by piece because freer access is given to the point of laceration and a sharp hæmorrhage due to a fragment penetrating one of the venous sinuses is easily controlled.

Operations under local anæsthesia are less apt to be followed by bleeding because the vomiting so common after inhalation of anæsthesia raises the venous tension.

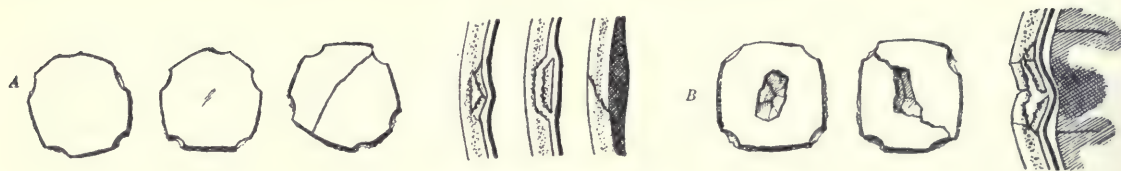
**Group 4. Wounds, usually of gutter type, with detached bone fragments driven into the brain.**

The risk of infection is much greater because there is a considerable defect in the skull through which brain substance protrudes and also because fragments of bone, usually contaminated, are driven into the brain. The injury to the skull itself is usually of the "gutter" type, produced by tangential wounds over the thicker portions, especially the parietal and frontal regions.

It is necessary to distinguish between cases in which the fragments have been driven into the lateral ventricles and those in which this has not taken place. The former condition was found in 14 of the 39 cases in this group, and the gravity of the prognosis in such cases is shown by the fact that 6 of the 14, or 42.8 per cent died.

Owing to the location of the majority of these wounds in the parietal vertex, many show the longitudinal sinus syndrome to which Sargent and Holmes first called attention, the most prominent symptoms of which are a bilateral spastic





Group 2. (Cushing).

paralysis of the lower extremities with possible involvement of one or both arms. Cushing describes in detail three cases in which this syndrome was found accompanying a gutter wound of the vertex and all showing the typical findings of a contusion of the mesial edges of both hemispheres.

The autopsies on four of the six cases where the fragments had penetrated the ventricle all revealed the fact that there had been an incomplete treatment of the track which was later extruded with a developing hernia cerebri. The fatalities in other words were due to abscess formation, meningitis, and gas encephalitis. The existence of the last named condition can no longer be questioned and emphasizes the necessity of removing all the devitalized tissue together with projectile and bone fragments.

*Group 5. Penetrating wounds with lodgement both of projectile and bone fragments.* There is a greater danger of a primary deep-seated infection when a projectile is lodged in the brain than from indriven bone fragments. This group is the largest of the nine into which Cushing divides his cases. Disregarding all other elements affecting the prognosis, the cases in this group, like those in Group 4 may be divided into two classes: (a) those in which the ventricle has escaped injury (41 cases, 26 recoveries, mortality 36.6 per cent); and (b) those in which the projectile has lodged in or traversed the ventricle (16 cases, no recoveries).

There was a predominance of wounds of entrance in the temporal region, the majority of the direct penetrating variety with relatively small scalp wounds. The missile was a shell or bomb fragment in 48 of the 57 cases of this group. In 22 of the 57, the missile was removed with the magnet and nail, but in 35 it was not removed either on account of its small size or inaccessibility. The mortality in the 35 cases in which the missile was retained (13 ventricular) was 60 per cent, and in the 22 in which it was removed (4 ventricular) the mortality was 31.8 per cent. A shrapnel ball is far less likely to carry in and implant infective material than is a jagged shell fragment. The cases with parietal penetration showed by far the highest mortality, there being 8 deaths with only 2 recoveries.

One may be deceived by the apparently good recovery made from the original injury in cases where the wound has been insufficiently treated. Such cases are often evacuated too early and succumb later either to a cerebral abscess or to a

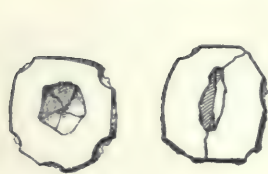
basilar meningitis due to rupture of an abscess into the ventricles.

Two most instructive cases of this kind are described showing the necessity of thorough primary wound treatment.

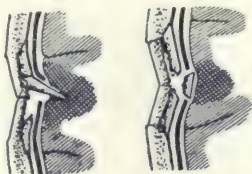
*Group 6. Ventricles penetrated or traversed by bone fragments or projectiles.* Emphasis has been laid by all on the fact that the prognosis in head injuries, so far as infection is concerned, chiefly rests on whether or not the dura is intact. It has been shown, however, that minor punctures of the dura (Group 3) are not necessarily accompanied by a bad prognosis, for, contrary to the general view, a fatal meningitis which spreads from the area of penetration is comparatively rare. Still more serious are the lesions (Groups 4 and 5) in which fragments, often soiled, are driven into the cerebral substance, and if not completely removed, leave an infected track, with swelling and extrusion of the oedematous brain through the dural opening and external wound,—the all too familiar fungus cerebri. In the course of time, either the suppurative process finds its way into the ventricle, or the advancing fungus distorts the hemisphere and draws out the ventricle, which ruptures into the infected track.

The prognosis is most grave, however, if the ventricle has been primarily opened with resultant early infection of the cerebrospinal fluid. There are two types of cases in this group: (a) those in which the ventricle has been penetrated by bone fragments; and (b) those in which it has been traversed or penetrated by a projectile. It is of interest to note that of 14 cases in the first type there were 6 deaths (42.8 per cent) while in the second type there were 16 cases with a mortality of 100 per cent. The projectile often lodges in the ventricle, this being true of 6 of the 16 cases.

Cushing is of the opinion that a serious infection may be established if the wounded are kept too long in the resuscitation ward. A cranial operation under combined morphine and a local anæsthetic may be carried out at the same time that warmth, fluids, and stimulants are administered. Cases with small foreign bodies do well if they pass the stage of early septic complication, but the latter occurs so frequently that one may with all conservatism follow the rule, "always remove a foreign body when possible," unless the act of removal is likely to increase the danger already made by the penetration. In many cases the patient lies



Group 3. (Cushing).



Group 4. (Cushing).



out unattended for a long time so that infection is given an opportunity to be established.

**Group 7. Wounds of craniocerebral type involving the face and ear.** Cushing doubts whether these should be placed in a separate group. They represent injuries usually of a severe nature in which, in addition to a wound exposing the brain, either the ethmoid cells and nasal sinuses have been opened (craniocerebronasal type), or the ear and petrous portion of the temporal bone has been involved (craniocerebro-aural type). In both types there is an added risk of secondary meningeal infection over and above that entailed by the original implantation of infected material in the wound. These cases are of an immediately serious nature, are associated with wounds passing from the cranium to the face, and in some there is a marked elevation of large bone fragments. The mortality in the 16 cases of this group was very high, 73.3 per cent. In one of the fatal cases a large unsuspected abscess formed in the relatively undamaged frontal lobe which, as is so typical of such cases, gave rise to no evidence of its presence except some headache followed by sudden onset of coma and high fever. At autopsy there was no meningitis present, but the left frontal lobe was occupied by a huge partly encapsulated abscess which communicated with the wound through a small punctured opening in the dura at the anterior tip of the lobe. The puncture had not been observed at the operation.

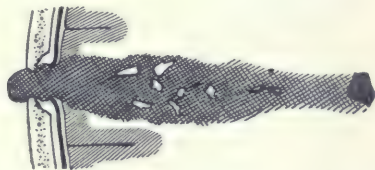
It is possible that Dakin's disclosure of the antiseptic value of dichloramine-T when sprayed on the nasal mucous membrane may make this an invaluable routine procedure in all basal fractures involving the cribiform plate. There was a higher percentage of fatalities in the cases in which the fracture permitted of communication between the middle ear and the brain. There were only 7 cases of this craniocerebro-aural type, with 6 deaths.

**Group 8. Wounds traversing the cranial chamber.** This new group contains only 5 cases with but 1 recovery. The reason for this is that few with wounds of this type survived to be brought into the hospital, hence under better conditions there should have been a much higher degree of recoverability from perforating wounds. Many of the cases which would be placed by others in such a group of through-and-through injuries have been placed by the author either in Group 5, where missiles stopped short of emergence, or in Group 6, where they traversed both the cranium and parts of the face or ear.

**Group 9. Bursting fractures with widespread cerebral contusion.** In this, the last group have been placed certain cases of major severity in which diffuse cranial fractures are associated with extensive and widespread contusions of the brain. They represent a type of injury which can be best relieved by a properly conducted cerebral decompression.

Among the 10 cases in the series which have gravitated to this group, there were 5 fatalities, a mortality of 50 per cent. This fairly high percentage of recoveries does not really represent the grade of case which the group was intended to contain, for a number of surgically treated fractures, largely basilar in type (three), have come to be included for lack of a more suitable group in which to put them. Other basilar fractures which recovered without operation or following a lumbar puncture are incorporated among the non-operative cases.

The question might naturally be asked, in cases of this kind, whether, after all, the decompression is essential, and whether lumbar puncture might not answer the same purpose, for one is not dealing with a permanent source of pressure like a tumor, but with a self-limiting process, provided the medulla is not complicated. It is well known that



Group 5. (Cushing).

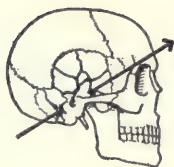


Group 6. (Cushing).





Group 7. (Cushing).



Group 8. (Cushing).



Group 9. (Cushing).



in these conditions of cerebral contusion the brain shows a marked tendency to take up fluids and become oedematous, and oftentimes the cerebrospinal spaces contain an excess of blood-stained fluid, even the subdural space, which under normal conditions contains very little fluid. It has become a matter of common observation that some measure of relief can be afforded by the withdrawal of fluid by the lumbar meninges. However, when the brain itself is greatly contused and swollen, the mere withdrawal of 20 or 30 ccm. from the cerebrospinal spaces is but a temporizing measure. Hence these punctures, even if repeated daily, actually afford but a very brief period of relief.

The operation for a subtemporal decompression is not always easy, and requires experience, facility, and a special type of rongeur forceps, if, without undue injury to temporal muscle, an opening of sufficient size is to be secured. However, there is little doubt but that in many cases a much more prompt return of consciousness is afforded by this measure than would otherwise occur, and in some cases it may be a life-saving procedure.

The term "cerebral decompression" is often very loosely used, not to say abused. The mere making of a hole in the skull around a depressed fracture, with wide opening of the dura to relieve pressure of a local contusion or infection, led to many disasters earlier in the war; and it is much better to restrict not only the term, but the procedure, as in the case of tumors, to measures directed toward the relief of pressure carried out in clean fields under temporal or suboccipital muscles, with immediate secure closure of the overlying structures. At best, however, a subtemporal decompression is not a measure of very wide scope in the craniocerebral injuries of warfare.

There is a general tendency on the part of orderlies and nurses who may be unfamiliar with head cases, or uninstructed as regards this particular point, to attempt to feed semi-conscious patients. A typical bronchopneumonia, brought about by misdirected efforts to administer fluids to patients with inactive swallowing reflexes, is a far from uncommon sequel. It is a good rule to keep every stuporous patient in a semi-prone position, and trial feedings should never be first attempted while they are lying on their backs.

*The operative procedure.* The principles of primary wound treatment which are now generally employed

by the allies, namely, excision and closure, cannot be applied to injuries of the skull and brain. The chief reason for failure in the past has been the long period of time which was allowed to elapse before thorough wound treatment was instituted, thus permitting infection to become well established.

As generally practised, the cleansing of a contaminated craniocerebral lesion has usually consisted in the excision of the scalp wound, piecemeal removal of the bony lesion, enlargement of the dural opening, extraction so far as possible, usually with the insertion of a finger, of the indriven fragments of bone or metal, and closure by sliding or replacing a flap of scalp over the area of the wound. This has been the practice, not only in the early hours when the wound is merely contaminated, but later on when infection has become established.

Subsequently, by the aid of alternate irrigation and suction through a soft flexible catheter inserted in the track, the clots and devitalized brain substance are painstakingly removed, the fragments of bone detected by the catheter are picked out by delicate forceps, and the projectile in as many cases as possible is extracted by the magnet. In short, the same principles of *debridement* utilized so successfully for wounds elsewhere have in their essentials been adapted to wounds involving the brain.

It would seem best that these operations should be performed at a forward area, preferably under local anaesthesia.

The clinical histories of the 219 operated cases have shown clearly that a large number of the recorded fatalities were avoidable, not only by the employment of a still more perfect technique, but by its more prompt application. The effects of cerebral contusion are often confused with shock, and the condition of many of these head cases does not improve until trepanation makes possible the evacuation from the intracranial chamber of the clots and pulped brain which are the occasion of pressure symptoms. In the present series, the more serious cases were retained for an average of twelve days.

The careful studies by Sargent and Holmes of a series of 1,239 cases, and by Tuffier and Guillain of a series of 6,664 cases which had recovered after trephining have shown that late sequels, such as epilepsy, insanity, delayed abscess, crippling paralyses, and other residual infirmities, are far

less common than had been anticipated. This may serve as an additional source of encouragement for those called upon to operate upon these difficult neurological cases.

D. N. EISENDRATH.

**Salmon, A.: Oculocerebellar Syndrome and Alternating Hemiparesis Due to a Tumor of the Posterior Quadrigeminal Eminence** (Sindrome oculo-cerebellare ed emiparesi alterna da tumore probabilmente gommoso di una eminenza quadrigemina posteriore). *Riv. di patol. nerv. e ment.*, Firenze, 1917, xxii, 505.

Tumors of the quadrigeminal eminence are comparatively rare. In 1910 Valobra in his thesis collected 56 cases from the literature.

The author relates a case observed in an infantry officer who had contracted syphilis three years before and whose Wassermann test was strongly positive. This patient showed the following syndrome: cephalalgia, vomiting, paralysis of the left superior oblique muscle, nystagmus, cerebellar ataxia, right-sided hemiparesis suggesting a tumor of the quadrigeminal bodies, localized particularly at the posterior bigeminal eminence. It is just at this point that the fourth nerve is in close contiguity with the posterior cerebellar pedunculi; hence the association of paralysis of the fourth nerve with the ataxia of cerebellar type.

The patient was placed on an intensive mercuric treatment and the symptoms rapidly abated.

The author feels justified in classifying this case as a tumor of the posterior quadrigeminal eminence, as the symptoms corresponded perfectly to those known in such cases. The alternating syndrome, fourth nerve paralysis on one side, hemiplegia or hemiparesis of the opposite side, shows an unilateral mesencephalic lesion situated about a posterior bigeminal eminence since it is in this region that the fourth nerve originates and departs on its course.

W. A. BRENNAN.

## NECK

**Dowd, C. N.: Indications for Removal of Enlarged Cervical Lymph-Nodes.** *N. Y. St. J. Med.*, 1918, xviii, 109.

Dowd states that the main indication for surgery in the case of enlarged cervical lymph-glands is the presence of tuberculosis and therefore it is important to make the diagnosis of tuberculosis early. Hyperplastic inflammation seldom calls for surgery. Hodgkin's disease and lymphosarcoma occasionally call for surgical interference, but the massive enlargement usually gives manifest indication. If a prompt diagnosis is made in the tuberculous cases, nearly all of them are curable by operation. The main difficulty is to distinguish tuberculous enlargement from simple hyperplastic enlargement. While some clinicians believe that nearly all enlarged lymph-nodes are tuberculous, those who have excised and examined them find that only a moderate proportion show the presence of tuberculosis.

There are certain guides for diagnosis. Childhood is the period of greatest lymphatic activity. Neck tuberculosis is rarely found in children under two years of age. Children under this age frequently have pyogenic infections which lead to abscess formation, but as these abscesses are acute and large, they bear little resemblance to the slowly progressing local cold abscesses which come from tuberculosis.

Progressive tuberculosis of the cervical lymph-nodes manifests itself in two main forms: (1) In about 80 per cent of the cases caseation and abscess formation result. In this stage the diagnosis is usually very simple, for the primary enlargement is usually just below the angle of the jaw and the cold abscess is located there or in a locality which pus from that source can reach. (2) In the remaining 20 per cent, the lymph-nodes enlarge without abscess formation and may extend throughout the neck from the mastoid to the clavicle, and from the internal jugular vein backward under the trapezius and forward under the jaws. They are rather hard, matted together, are not easily movable, and do not show as good a tendency to local limitation as do the caseating variety.

Hyperplastic nodes show a tendency to subside. Dowd has records of 726 cases operated upon by himself or his assistants, and his results have shown that the earlier the case is operated upon, the more favorable the result.

He says that there are three very practical considerations which bear on the subject and which have prevented many physicians from knowing just what surgery can do. These are: (1) uncertainties in diagnosis; (2) technicalities in operation; (3) recurrences in late and unfavorable cases.

The uncertainties in diagnosis cause two types of errors. When tuberculosis is present and not recognized, the patient drifts past the most favorable period for successful treatment; and second, when simple hyperplastic glands are wrongly believed to be tuberculous, the patient is subjected to unnecessary operation and suffering.

The details of the operation involve many technicalities and unless the surgeon is well versed in the anatomy of this particular region, he is liable to cause serious damage to the surrounding tissues. Cases of facial paralysis and cutting of the spinal accessory have been reported as a result of carelessness or lack of necessary knowledge on the part of the operator.

Those men who only see late and unfavorable cases are not enthusiastic about operation. Surgeons whose experience is largely with adult patients with extensive tuberculosis naturally do not become enthusiastic over the treatment in children and in this way many cases which would otherwise be cured are permitted to reach a stage where operative treatment is of little permanent value.

Three kinds of treatment are often considered: constitutional, X-ray, and tuberculin. Dowd has made a study of all three and can see no reason for



advocating long periods of treatment which give uncertain results when there is a simple short treatment which gives such good results. He advocates the best hygienic and constitutional surroundings which can be obtained, but as many of his cases lived in unsanitary tenement house surroundings, he

has had the opportunity of seeing what surgery can do without hygienic help. He says that the fear and suspicion of surgery brought about by a misapprehension of what surgery will do are the reasons for delaying operative treatment in many of these cases.

G. W. HOCHREIN.

## SURGERY OF THE CHEST

### CHEST WALL AND BREAST

**Boggs, R. H.:** *The Treatment of Carcinoma of the Breast by the Roentgen Rays.* *Interst. M. J.*, 1918, xxv, 210.

The author states that roentgen therapy is today a recognized method in the treatment of postoperative cases, recurrent and metastatic, primary inoperable and primary cases which do not permit operation. He believes even in early cases operation should be supplemented by roentgen therapy, thereby preventing from 25 to 50 per cent of recurrences. To be effective this radiation should be done thoroughly by competent operators, giving full physiological doses to every chain of lymphatics draining the breast as well as to the opposite side of the body. Roentgen radiation produces a sclerosis of the lymphatics which in itself tends to oppose cancer dissemination. Such treatment is of value as an ante-operative as well as postoperative procedure, often rendering an advanced case operable, and if deep metastases have not taken place, more permanent cures can be obtained surgically.

The author uses the cross-fire method as much as possible. Three or four areas of anterior chest wall receive treatment and the liver area is given one anteriorly, laterally, and posteriorly. The axilla is given three or four doses and the lateral chest wall below the axilla an additional one. The supraclavicular region is divided into four areas. The supra- and subscapular areas on the affected side each receive a full dose. The mediastinum should receive one or two treatments through the back. The opposite side is rayed according to indications and never receives less than from four to ninety-eight treatments during the course. The epigastric region must never be omitted, as this is one of the avenues by which the liver and pelvic viscera metastasize.

Since operation has about reached its limit and since ultraradical operations are not practical until some better form of treatment is discovered, the splendid results achieved from radiation furnish more than sufficient reasons for giving every case of carcinoma of the breast postroentgen treatment. In recurrent and inoperable cases, often a temporary cure can be produced. ADOLPH HARTUNG.

**Eastman, J. R.:** *Hæmothorax in Gunshot Wounds.* *Indianapolis M. J.*, 1918, xxi, 105.

Hæmothorax is a common complication of penetrating chest wounds. It may be sterile or septic.

The symptoms of sterile hæmothorax are in general those of pleural effusion. There is percussion dullness, diminished voice and respiratory sounds, and tactile fremitus over the area of effusion, with Skoda's resonance above it. The heart is displaced by hæmothorax on the left. The diaphragm is high from atonic relaxation. There is dyspnœa, hæmoptysis, moderate fever and slight icterus. Differential diagnosis is from pneumonia, pyothorax, pneumothorax, and massive collapse of the lung. In the latter condition there is no displacement of the heart.

The treatment is immobilization of the chest, rest, and aspiration of blood. If there is mechanical embarrassment from effusion, aspiration may be performed. Artificial nitrogen pneumothorax to loosen adhesions and promote absorption is recommended in obstinate cases.

The clinical features of septic hæmothorax are a rise in pulse and temperature, pain, tenderness, insomnia and delirium. The signs are those of sterile hæmothorax. The rise in temperature is the most suggestive symptom.

Infection should be suspected in all cases which are not progressing favorably after the fourth day. Treatment consists chiefly in thoracotomy, subsequent irrigation, bismuth paste injections and plastic operations.

C. A. HEDBLOM.

**Pierson, P. H.:** *Spontaneous Pneumothorax.* *Boston M. & S. J.*, 1918, clxxviii, 385.

The term spontaneous pneumothorax refers to cases of pneumothorax in persons with no demonstrable lung disease. The condition is also referred to as "idiopathic pneumothorax," "latent pneumothorax," "pneumothorax with insidious onset," and "pneumothorax silencieux."

Only 90 cases have been collected from the literature. Three different modes of origin have been described, namely: (1) rupture of vesicular blebs, as large as hen's eggs, in pulmonary emphysema; (2) direct tear of the pleura by a tug on the adhesions; and (3) senile atrophy of the pleura. Tearing by adhesions is the most probable cause, and the presence of adhesions suggests a tuberculous focus as the underlying cause. The rupture often occurs following strenuous exertion, but some have occurred during sleep.

The symptoms are dyspnœa, elevation of pulse-rate, and more or less shock. A history of rather sudden onset of dyspnœa in a healthy individual

with the physical signs of "wooden" dullness or hyperresonance and diminished or absent breath sounds on the affected side indicates pneumothorax. The physical signs suggest fluid; the symptoms do not.

Treatment is absolute rest. The prognosis in these non-tuberculous cases is almost 100 per cent.

Four illustrative case histories are given in detail.

C. A. HEDBLOM.

**Morelli, E.: The Treatment of Empyema** (Contributo alla cura dell' empiema). *Policlin.*, Roma, 1918, xxv, sez. med., 153.

Since 1910 the author has persistently advocated that the treatment of spontaneous pneumothorax concomitant with pulmonary lesions, no matter how caused, ought to consist in maintaining the pneumothorax at such tension as to immobilize and compress the lung and hence favor cicatrization. This same idea he has applied to war lesions as surgeon-in-chief of one of the Italian hospitals for the special treatment of thoracopulmonary wounds. The Forlanini-Morelli pneumothorax method has been recognized in France and Germany by Duval, Hess, and others.

Having established the efficacy of pneumothorax for the rapid cicatrization of lung lesions, Morelli endeavored to solve the problem of open pneumothorax and the empyema which almost always follows it. He checked hæmorrhage by rubber balloons which hermetically sealed the thoracic opening and prevented the exit of air from the pleural cavity. He found that blood trickling from the lung into the cavity increased the tension of the air, producing a true pulmonary autotamponade. It was also observed that anatomic closure of the thoracic wound often followed the artificial closure without the production of empyema. Recently in 22 cases of open pneumothorax Morelli was able to close 12 without empyema.

In order to reduce empyema he had previously lavaged the pleural cavity with Gianettasio's chlorosol after thoracentesis. This he found satisfactory. Early and systematic collapse also reduces the chances of occurrence of empyema in lung lesions. But even with these preventive means empyema may develop. In established empyema the treatment can only be pleurotomy, or better, thoracotomy unless the empyema is concomitant with a low situated open pneumothorax. By evacuating the pus there is always improvement, but recovery is slow. Also in the majority of the cured cases there are anatomical alterations and strong diminution of the pulmonary function.

Forlanini as far back as 1880 published a work on the treatment of pleural empyema which Morelli says attracted little attention, probably because it was written in Italian. Forlanini demonstrated that the effusion should be evacuated and air substituted for it and that pneumothorax should be maintained then in constant decompression until the lung dilated and the pus was eliminated.

This method has now been applied to war wounds by Morelli after making some necessary modifications owing to the existence of a traumatic thoracotomy. He uses inflated rubber bags to stop the thoracic opening and obtain a hermetic closure. A drain tube passes through. His apparatus for evacuating the pus and supplying air to the pleural cavity is described in detail and illustrated. In treating a wound with a pneumothorax so largely open that there is no hope of avoiding empyema, he applies the rubber inflated bag to the breach and maintains a positive pressure in order to obtain cessation of hæmorrhage and effect cicatrization.

After ten days of compression the pneumothorax is reduced to atmospheric pressure for five days more. After fifteen days cicatrization may be presumed to have occurred and only then ought aspiration of the lung to be commenced. There is rapid improvement and if the empyema is recent, if the pulmonary destruction is not severe, recovery is always without any thoracic deformity and with excellent functioning. The rubber bag is left in site as long as possible; at first it should be changed often, but later on every four or five days. The sac can be maintained well in its place by the use of adhesive strips, and it can be protected by a covering of wire mesh. The closure of the thoracic breach may be expected in about fifty days or less.

By compressing the lung, by thoracentesis and pleural lavage, and by hæmothorax balloons, Morelli has reduced the number of empyemas to the point that in 85 cases of certain pulmonary lesion with closed thorax he has had only 2 cases complicated by empyema; and in 22 cases with open pneumothorax, only 6 cases of empyema. In 110 cases with certain pulmonary lesions there were only 5 deaths. This was in an advanced surgical post and the cases were of all kinds just as they arrived from the trenches.

It is important to note that in almost all the cases recovery was obtained with normal pulmonary function. Radiologic and radiographic observation showed that in a large number of cases the return to normal was absolute, anatomic, and functional.

The author's experience with almost 400 thoracopulmonary wounds leads him to assert that expectant treatment of lung wounds should be replaced by very active and early operation. The operative treatment varies according to the case. In Italy the military medical authorities have swung completely to this view.

W. A. BRENNAN.

**Holmgren, I.: The Treatment of Tuberculous Empyema.** *Nord. med. Ark.*, Stockholm, 1917, i, Inn. Med., No. 12.

Since 1908 Holmgren has treated tuberculous empyema by thoracentesis. The effusion is withdrawn through one puncture opening and air is introduced at the same time through another. Sutherland has recently described a similar method employed by him since 1910. However large an empyema may be, it can be withdrawn at one



sitting without discomfort or risk to the patient. The withdrawals should be repeated at intervals of about a month, and the effusions will be found to become less and less as time goes on, as well as thinner. The period of time elapsing before secretion of pus ceases varies between one and eleven months.

Holmgren punctures with two fine needles. The pus is aspirated through one while air is simultaneously introduced through the other. The spot for the withdrawal of pus is selected as low as possible, usually in the tenth intercostal space between the posterior axillary and angular lines, and this is first anesthetized with novocaine solution. The point for the introduction of air is chosen somewhat higher, as in the next intercostal space above. This is also anesthetized. A Saugman pneumothorax needle is used. Before air is introduced the operator must be absolutely certain that the point of the needle is actually in the effusion and not in the lung. The operator must therefore see matter exude through the needle or, if the intrapleural pressure is less than that of the atmosphere, he must hear air being voluntarily drawn in, before it is fixed to the air tube. This arrangement makes it possible to observe on a manometer the intrapleural pressure during the course of an operation; to regulate it as desired by the pumping of the air, so that the pressure is maintained at a suitable degree the whole time without too violent variations; the final pressure can be arranged as wished. By auscultation of the bubbling air the position of the surface of the effusion can be controlled at any time during the operation. The formation of pus in the puncture channel or of fistulae occurs very seldom with this technique, possibly owing to the small caliber of the needles.

The prognosis depends in this, as in other methods, mainly upon the extent of the tuberculosis in the lungs. Often the empyema is only the final episode in a tubercular lung affection, so that the mortality must be high no matter what method is adopted. If the state of the lung does not place obstacles in the way of improvement, the prognosis with this method is good, and the patient can usually attend to his occupation during the whole treatment.

Since 1911 Holmgren has treated 28 cases of tubercular empyema with 17 deaths, or 60 per cent mortality.

W. A. BRENNAN.

### HEART AND VASCULAR SYSTEM

**Costantini, H., and Vigot, M.: Immediate Operation in War Wounds of the Heart** (*Opérations immédiates pour plaies du cœur par projectiles de guerre*). *Rev. de chir., Par.*, 1917, liii, 383.

The authors remark that in war literature there are but few cases of immediate operation on the heart. They do not think that such lesions are rare, but rather that they are not often diagnosed, especially when the wound in the chest wall is small. Radioscopy gives one characteristic sign

of a penetrating heart wound, i.e., the immobility of the edges of the cardiac shadow. The clinical details of some cases are given.

The authors discuss: (1) the symptoms of heart wounds; (2) the route of approach to the heart.

The symptoms of heart wounds are extremely variable and appear to depend on the situation of the injury and the degree of tension of the hæmopericardium. A non-perforating wound of the left ventricle gives a hæmopericardium under very strong tension with signs of angina. A perforating wound of the left auricle gives a hæmopericardium with a slight tension and causes cyanosis as in asphyxia. A perforating wound of the right ventricle may cause a hæmopericardium of medium tension with signs of severe hæmorrhage. An injury of the apex gives only an insignificant hæmopericardium.

Radioscopy is of great importance in the diagnosis of heart wounds. By showing immobility of the heart shadow it indicates a heart injury with certainty. When the projectile is in the thickness of the heart muscle, radioscopy cannot always be relied upon to make it evident. The hæmopericardium in such cases plays a very obscure rôle. When radioscopy does not show a hæmopericardium, the cardiac wound is not dangerous and operation is not urgent. Nevertheless there may be a grave heart wound without hæmopericardium. In such cases the hæmorrhage is into the pleura.

As regards the route of approach to the heart, the authors, while recognizing that there are other ways, think sternal section is the best, and that this should be systematically used unless one is satisfied with a blind and insufficient exploration. When there is a bleeding wound it is necessary to get a good view and sternal section alone permits this. The pleural cul-de-sacs should be respected as much as possible even if, as it happens in many cases, the pleura is already opened. Extensive laceration of the cul-de-sacs is not necessary in order to expose the anterior face and almost the whole of the lateral faces of the pericardium.

The authors discuss the chondrocostal flap method of Fontan; the definite resection of the third, fourth, and fifth ribs; the chondral flap and transverse section and resection of the left border of the sternum; the chondrosternal flap with an external hinge; Tuffier's method of forced separation of the fifth and sixth cartilages. These methods have some advantages and disadvantages. From their experience in the cases operated upon and from experimental cadaver investigations the authors prefer resection of the fourth cartilage and of a segment of the sternum, followed by forced separation. Three centimeters of the sternum are resected. Then by Tuffier's method of separation an excellent light is obtained. The pleural cul-de-sacs can be avoided without injuring them. This, the authors think, is the best method of exploring the heart region. The method has the disadvantage of being mutilating; but the amount of mutilation

is unimportant. Rapid cicatrization may be hoped for. The authors have tried this method on the cadaver only, but think it should be tried on living subjects.

There are two other points to which the authors call attention in connection with heart surgery. These are: (1) the necessity of terminating the operation by a blood transfusion; (2) the use of sharp aneurism needles for suturing the heart wall. If a Reverdin or some other needle is used, there is risk of tearing the heart wall. W. A. BRENNAN.

**Guillermo, M. L., and Montoya, J. M.: Suppurative Pericarditis and Pericardotomy** (Pericarditis supurado y pericardotomia). *Repert. de med. y cirug.*, Bogotá, 1917, ix, 115.

The authors report a case of suppurative pericarditis in a boy aged eight years, the result of a traumatism in the precordial region. After clinical observation for some time during which the symptoms did not abate, the authors decided to operate.

Under chloroform a transverse incision about 5 cm. long was made starting from the sternal edge along the fifth costal cartilage; and after dissection of the tissues the pericardium was exposed, opened, and a quantity of bloody fluid drawn off; a cigarette drain was placed, and the incision partly closed. The operation occupied thirty-five minutes.

The child was able to get up on the twentieth day, and made a normal recovery.

The authors discuss the case from the point of view of either a purulent pericarditis or simply a pleurisy with consecutive pericarditis.

Pericarditis in the child has an extremely grave prognosis, the immediate mortality being about 60 per cent. Elliot reported only one recovery in 22 cases treated surgically; and Combe states that even with costal resection and drainage the chances of recovery are very slight.

The complete recovery in the present case after operative treatment appears therefore to the authors a sufficient reason for reporting it. W. A. BRENNAN.

## SURGERY OF THE ABDOMEN

### ABDOMINAL WALL AND PERITONEUM

**George, A. W., Leonard, R. D., and O'Brien, F. W.: The Roentgen Diagnosis of Disease of the Upper Right Abdominal Quadrant.** *Med. Clin. N. Am.*, 1918, i, 1007.

The authors give credit for most of the positive advances made during the last ten years in the roentgenologic diagnosis of disease of the duodenum and gall-bladder to American contributors and attribute it largely to the extensive use of the plate method in contra-distinction to the fluoroscopic method employed by continental workers. They give a detailed description of the duodenum and its relation to surrounding structures.

Anatomically the first portion of the duodenum is a constant entity which can always be demonstrated on an X-ray plate with characteristic shape and outline without exception, if it is normal. Any constant defect in contour means a pathologic condition and this condition is practically always ulcer. In simple adhesions the deformity will be found to vary at different times. The second portion of the duodenum, when dilated to any considerable degree, means obstruction somewhere beyond it. Its course may give valuable information relative to gall-bladder disease; when passing outward toward the liver border, then curving to its normal position, this may be considered almost pathognomonic of that condition.

Regarding gall-bladder disease, the authors maintain that the normal gall-bladder cannot be demonstrated roentgenographically, and if it can be so shown, some pathologic change has taken place either in its walls or its contents. Its size, shape, and location are variable. Relative to gall-stones,

the authors claim that with proper technique they can be demonstrated by the X-ray whenever present. This technique consists of making oft-repeated exposures of the patient lying prone after he has fasted for at least six hours. Additional information relative to gall-bladder disease may occasionally be obtained from observations of the opaque meal in the intestines. The jejunum may be transposed to the right upper quadrant and contain an unusually large amount of gas. The appearance of the gas-filled hepatic flexure and transverse colon as seen in the six- and twenty-four hour plates made following the barium meal is quite characteristic in gall-bladder disease. It appears on the plate like a saccululation of gas with a faintly limned periphery of barium just above which or impinging upon it can be seen the visualized gall-bladder.

ADOLPH HARTUNG.

**Syms, P.: Pneumococcus Peritonitis.** *Ann. Surg.*, Phila., 1918, lxvii, 263.

From an exhaustive review of the literature the author finds that pneumococcus peritonitis is a definite entity. It may be idiopathic, that is, occurring only as a local manifestation, or it may be the sequel to some previous site of pneumococcal infection, as the lung or pleura, or it may be present as a part of a general septicæmia in which other organs are simultaneously involved.

It is a rare disease which affects particularly children. It is much more frequent in girls than in boys, in the proportion of three to one.

Two varieties are found: (1) general diffuse peritonitis, and (2) an encysted or localized process. Some claim that these are but stages of the disease; others claim that there are two distinct varieties.



Whether the diffuse peritonitis is an early stage or a special form, it represents the period of utmost gravity. Annand and Bowen in analyzing 91 cases found a mortality in the diffuse type of 86 per cent. In the same series in the encysted form there was a mortality of but 14 per cent.

The salient points in the diagnosis of primary pneumococcus peritonitis are the sudden onset, often with a chill, and followed by an extremely high temperature with a high leucocyte count. Diarrhœa is a conspicuous symptom and peritonitis with diarrhœa should always be looked upon as probably of pneumococcic origin. There is lack of localizing symptoms, as compared with the perforative type of peritonitis, and the abdomen is described as having a "doughy" feel. There is marked toxæmia and the patient seems far more ill than the abdominal symptoms would indicate. Bacteræmia is generally present and blood cultures should always be made.

When peritonitis is established, there will be signs of free fluid in the abdomen or of loculated accumulations and distention of the abdomen. This nearly always begins in the lower part of the abdomen and protrusion or perforation at the umbilicus is a late sign which is very characteristic of this disease. When the abdomen is opened, there will be found a characteristic odorless, seropurulent fluid of a yellowish-green color containing great masses of fibrin. It is always very difficult to distinguish between the peritonitis caused by the pneumococcus and that of the streptococcus both clinically and bacteriologically, and undoubtedly mistakes have occurred.

In the encysted form there seems to be no question but that the best treatment is immediate laparotomy. On the other hand, most authors agree that on account of the high mortality, from 86 to 100 per cent, operation is not the proper treatment when the peritonitis is generalized and the toxæmia is severe. Under such circumstances the treatment should consist in open air, general support, the Fowler position if the pulse will stand it, and proctoclysis. The author believes that the serum treatment should have the same place there that it has in pneumococcus infections elsewhere.

GATEWOOD.

**Thun, H. von: Sliding Hernia.** *Nord. med. Ark.*, Stockholm, 1917, i, Kirurgi, No. 18.

It may happen in cases of so-called dry hernia, or in cases where the hernial sac and its contents have become intimately adherent to each other, that the serosa of the intestinal loop in the sac may be scarified during operative manipulations. Generally an experienced surgeon will know in which layer he is working, but it is possible that he will find himself in loose connective tissue where nothing particular is found, when suddenly the knife will slip into the lumen of the intestine. As a rule in such cases the surgeon has been operating in the mesentery which emanates from the wall of the

hernial sac, while the sac itself is formed more or less by mesentery plus intestine plus parietal peritoneum, or it may be that there is no sac at all. Such cases formerly were called herniæ without or with only a partial sac, but during recent years they have been called sliding hernia, or what the French call hernia "*par glissement*." The characteristic features of these herniæ is that part of the suspension of the intestine either with or without the mesentery is found in the sac itself. Whether it is a case of true sliding from the peritoneal cavity or a descent like that of a testicle is not known.

Three varieties of sliding hernia may occur. In the first type there is an intestine with mesentery, this latter emanating from the hernial sac and its vessels passing into the sac. Thus the surgeon may enter the intestine by the incision without having passed any peritoneal surface and may injure the nutritive vessels of the intestine. In the second type the intestine is found without the mesentery in the wall of the sac. The risk of injuring the intestine is here much greater. In the third type no part of an intestine covered with serosa is in the hernia, but only a projection of part of an intestine without serosa. This last form is extremely rare.

As regards the sections of intestine involved in the sliding hernia, the author says that the lower part of the ileum might slide down into a hernia not covered with serosa. But as a rule the sliding hernia involves the colon. It is by no means rare that the cæcum, appendix, or the lower part of the ascending colon are attached to the hernial sac in such a way as to lead to the surmise of the existence of a sliding hernia. Similarly with a left hernia a portion of the sigmoid with or without mesentery may slide down, including vessels and mesentery root.

By far the greater number of sliding herniæ are inguinal. In examining the case records of 550 herniæ the author has found 9 unquestionable cases, of which he personally observed 6 cases. Six of the nine cases were left inguinal herniæ containing part of the sigmoid; 3 were right inguinal hernia containing the cæcum and adjoining parts. All the cases occurred in males. In two of the cases an injury of the intestine occurred during operation.

The surgical difficulties in these cases do not alone consist in avoiding injury to the intestine or its vessels, but in the closure of the hernial orifice. The method which the author has found most satisfactory is to loosen the connective tissue in which the intestine is embedded, remove superfluous peritoneal material, suture the peritoneum with tobacco-pouch sutures; or, if this appears to cause too much strangulation, then by a continuous or knotted suture. Then the hernia orifice is closed in the usual way.

W. A. BRENNAN.

**Hotchkiss, L. W.: Observations on the Treatment of Direct Inguinal Hernia in Adults.** *Tr. Am. Surg. Ass.*, Cincinnati, 1918, June.

From a study of a reasonably large number of recurrent direct herniæ in hospital practice, the

author has reached the conclusion that, as a class, they are often carelessly operated upon, and that the recurrences are more frequent than was generally known.

He found, in an examination of a number of recurrent herniæ which he had repaired, that the recurrence had, in a large proportion of cases, been due to an overlooking at the original operation of a small direct hernial sac which was to be found, in a large number of primary cases, lying to the inner side of the deep epigastric vessels and constituting always a potential, and commonly an actual, direct hernia, which was often overlooked by operators who were not careful to expose the whole neck of the hernial sac in every case and include it in the ligature flush with the parietal peritoneum.

Attempting to use some one method of repair in all cases, rather than trying to find, if possible, some method which was adaptable to the individual case, would also account for a certain number of cases of failure in the hands of routine operators.

The whole subject is worthy of careful study, and a careful review of methods and results.

In cases of direct inguinal hernia, the weakened, bulging transversalis fascia is the structure which needs bolstering up. Various methods had been proposed, but the author found that the aponeurosis of the anterior sheath of the rectus muscle split and sutured carefully to Poupart's ligament from the pubic spine outward as far as practicable had served well to replace the deficient weakened fascia transversalis, and had given reliable and lasting results. A vertical incision is made through the sheath of the muscle and a flap is fashioned which can be easily turned outward so that its outer edge comes readily in contact with Poupart's ligament, where it is securely stitched with chromic catgut. In cases where the relaxation of the tissues is marked, the principle of the overlap is further utilized with the external oblique aponeurosis and the cord is brought out in the subcutaneous fat.

**Rayner, H. H.: Reduction en Masse of a Strangulated Direct Inguinal Hernia.** *Brit. M. J.*, 1918, i, 258.

The patient three days previously had begun to have pain in the abdomen and right groin, accompanied by vomiting and the appearance of a lump in the right groin. The swelling was tense and the size of a tangerine orange, yielding no impulse on coughing. It was clearly a strangulated hernia and with gentle manipulation was easily reduced. The patient felt relieved for a time, but during the night and the next day she was uncomfortable, had occasional slight colic, and vomited twice. The bowels had not moved nor had there been passage of flatus. On the fourth day there was slight abdominal distention.

Laparotomy was done which disclosed a loop of small intestine, four inches in length and about three feet above the ileocæcal junction, tightly strangulated in a peritoneal pouch which proved to be a

direct inguinal sac displaced from the inguinal canal into the abdominal cavity. By dividing the orifice of the sac the loop of strangulated intestine was released; at its point of entrance into the sac the loop showed a narrow annular strip of gangrene, which was covered over by an invaginating suture. The patient left the nursing home within three weeks and is now in good health.

V. C. HUNT.

**Stapelmohr, S. von: Primary Sarcoma in the Omentum Majus** (Ueber primäre Sarcome im Omentum majus). *Nord. med. Ark.*, Stockholm, 1917, i, Kirurgi, No. 21.

The author presents a detailed study and review of the literature on omental sarcoma; he reports a personal case of angiosarcoma in the gastrocolic ligament in a man forty-eight years old. The man was operated upon by marsupialization of the cyst. This was not removed on account of the patient's condition. He died of pneumonia and heart failure three days later.

The author gives as a summary of his study:

1. Forty-nine cases of omental sarcoma, including the present case, have been published up to date; the ligamentum gastrocolicum is included with the omentum. The proportion of women to men is about three to two.

2. The most common type is the spindle-cell sarcoma; next come myxo-, round-cell, angio-, fibro-, mixed cell, and lymphosarcoma in the order named.

3. Angiosarcoma occurs usually after the age of fifty years; the age in other types usually is under forty years. The female sex is more prone to angiosarcoma, whereas myxosarcoma is usually met with in males.

4. Sarcomata may be circumscribed or diffuse. Fibrosarcomata and spindle-celled sarcomata are generally circumscribed. Angiosarcoma is mostly diffuse.

5. In 7 of the cases the sarcoma was in the ligamentum gastrocolicum; usually it is the omentum. In four cases the tumor was pedicled, the pedicle being twisted in two of these. In three cases the tumor was located in a hernia sac.

6. These tumors are in general very rich in blood and tend to a cystic condition by necrosis.

7. Circumscribed tumors may reach a weight of 18 kg., the diffuse type being much smaller.

8. Fibrosarcoma as a rule is the smallest type. Ascites do not occur in more than 50 per cent of the cases; it has been observed in almost 43 per cent. Angiosarcoma is usually associated with ascites; fibrosarcoma rarely. In more than one-third of the ascites cases, the ascitic fluid was mixed with blood.

9. Metastases occur in most of the diffuse types. Fibrosarcoma shows the least tendency to metastasis or recurrence; while angiosarcoma shows the greatest.

10. In 50 per cent of the reported cases adhesions were found.



11. A period free from symptoms, varying from five months to two years, may occur in omental tumors. After this there appear lassitude, loss of flesh, abdominal pain, stomach and intestinal disturbances, a palpable stomach tumor, and occasional urinary troubles.

12. The abdominal pains may be due to adhesions, but like the stomach and intestinal disturbances may be due to the growth of the tumor with stretching and dislocation of the abdominal organs.

13. In most instances the tumor may be palpated beneath the abdominal wall. As a rule it appears in the umbilical region, but it may when pedicled or when very large involve the lower part of the pelvis.

14. Circumscribed tumors before they become too large are more amenable to removal than the diffuse type; however, owing to adhesions they are more or less irremovable.

15. In 70 per cent of the female cases circumscribed tumors were mistaken for abdominal tumors. In 6 cases the diagnosis was an omental tumor, three being diagnosed as sarcoma. None of the other cases were correctly diagnosed.

16. Diagnosis is always uncertain. The Péan symptom-complex, either with or without the addition of ascites, was not present in any case. In diagnosis also the question of operability has to be considered.

17. The duration of the disease prior to operation averaged about nine months. In 11 cases good results were reported after operation; of these 4 were observed to be free from recurrence for more than a year, and one for eight and a quarter years. Round-celled, fibro-, and spindle-celled sarcomata may be cured radically by operation if the tumors are circumscribed and pedicled; a diffuse myxosarcoma was operated upon successfully and remained free from recurrence after three years.

18. The fibro- and angiosarcomata appear to be different in their propensities. Fibrosarcoma is circumscribed, and ascites is usually absent; there is but slight tendency to metastasis or recurrence; the duration is longer. Angiosarcoma is mostly of the diffuse type, and there is usually ascites; there is a tendency to metastasis or recurrence, and the illness is short before death intervenes. The prognosis of angiosarcoma is therefore considerably worse than in the case of fibrosarcoma; and it may be added that angiosarcomata usually appear in more advanced age.

19. Ascites may be present in omental sarcomata; the prognosis is not on this account bad, and even a bloody ascites need not give an absolutely bad prognosis.

20. Removal of the tumor should be attempted; if it is large or diffuse, the whole omentum may be removed.

21. Removal of the omentum or an extended omental resection may not give greater protection against recurrence than removal of the tumor with smaller omental resection.

W. A. BRENNAN.

**Chueco, A.: Large Mesenteric Cyst Removed by the Vaginal Route** (Voluminoso quiste hidatídico del mesenterio extirpado per via vaginal). *Rev. argent. de obst. y ginec.*, Buenos Aires, 1918, ii, 87.

Chueco attempts to show that any abdominal or pelvic tumor which fulfills the two essential conditions of being reducible and exteriorizable may, whatever its size, be removed by the vaginal route. In the case reported, a tumor the size of a fetal head at term apparently joined to the uterus in the region of the cervix was diagnosed as an interstitial uterine fibroma.

On making an interior colpotomy and enlarging the operative field, loops of intestine were found in the vicinity of the uterine neck and on further search, after destroying adhesions and exerting downward pressure on the external abdomen, a cyst was found strongly implanted in the mesentery. It was evacuated by a trocar, exteriorized, and enucleated through the vagina. W. A. BRENNAN.

### GASTRO-INTESTINAL TRACT

**Jones, N. W.: Achylia Gastrica and Chronic Connective Tissue Lientery; a Clinical Study of 322 Cases.** *Am. J. M. Sc.*, 1918, clv, 335.

The author defines connective tissue lientery as the presence of abnormal amounts of undigested connective tissue in the stools.

He reports 245 cases of achylia gastrica not associated with cancer or other wasting disease.

The greatest incidence is during the child-bearing age in women, and forty to sixty years in men, during the period of greatest stress. There were 96 males and 149 females; 132 cases were of asthenic build, while 113 were broad; 182 of the whole series were really asthenic.

Generally speaking, the asthenic group generally had low stomachs, with long emptying time, and were usually constipated, while the symptoms were very like those complained of by neurotics with normal gastric chemistry. Connective tissue lientery was found in 11 out of 17 cases. As to treatment, this group had to be cured of the neurasthenia as well as of the gastro-enteric condition before they were symptom-free.

The broad group usually had a rather short emptying time, and diarrhoea was more common than constipation. Connective tissue lientery was present in 8 out of 11 cases. Besides the gastrointestinal symptoms, this group complained of headaches, muscle and joint pains, toxic symptoms.

On proper diet these cases quickly responded and were seen symptom-free, and could often return to a meat diet without further difficulty.

As to treatment, the food should be well cooked and finely divided. Connective tissue should be avoided. Hydrochloric acid helps some cases, but makes others worse.

The asthenic patients must have proper treatment for that condition. The prognosis in many cases is good.

H. J. VAN DEN BERG.

**Finochietto, R.: Precolic Gastro-Intestinal Anastomosis** (Anastomosis gastro-intestinal precólicas). *Rev. Asoc. méd. argent.*, Buenos Aires, 1918, xxviii, 88.

One of the complications which may arise after anterior gastro-enterostomy is the creation of peritoneal orifices in which the intestine may become incarcerated. In all precolic gastro-intestinal anastomoses, even in simple anterior and posterior gastro-enterostomy as well as in the Polya-Mayo technique, the loop of small intestine and its mesentery on the one side and the stomach, colon, and transverse mesocolon on the other form the boundaries of an orifice in which the small intestine may be occluded. The author gives some figures to illustrate the mechanism by which this occurs.

Finochietto thinks that in anterior anastomosis the first stage ought to consist in the fixation of the great omentum and transverse colon to the large curvature. The loop which is anastomosed to the stomach should be only long enough to reach the anterior face of that organ, i. e., 15 to 20 cm.

If the mesentery is very short, it is only necessary to seek a point situated about 50 cm. from Treitz's fossa and expose and section the mesentery there as much as may be necessary to give the loop the desired dimensions.

In anastomosing the viscera special care must be taken not to produce rotation of the loop around its mesenteric insertion. The incision of the intestine ought to be limited to its right face and not include its free border, as this border is preserved for fixation in the anterior serosa.

The anastomosis being completed, the prevertebral part of the orifice is closed as far as possible by continuous sutures. This puts the head of the mesentery in contact with the transverse mesocolon and further on with the anterior face of the colon. This suture scarcely complicates the operation and will always be a factor of safety. It ought to be a part of precolic anastomoses. W. A. BRENNAN.

**Kerr, N.: Triple Wounds of the Stomach from a Single Intact Bullet.** *Illinois M. J.*, 1918, xxxiii, 267.

The author cites two instances in civil life where a single bullet made three perforations in the stomach. This result is due to the three contraction waves, each of which becomes quite deep as it passes toward the pylorus, thus making it possible for a bullet to graze or even perforate the tip of an inverted crest as it passes through.

In the first case, described by Woodson, in the *Nashville Journal of Medicine and Surgery* in June, 1896, the bullet entered the patient's left side below the apex of the heart. Operation which occurred about sixteen hours after the injury showed that the bullet had entered the cardiac end of the stomach and in doing so had severed the gastro-epiploica sinister artery.

After the wound in the stomach was sewed up, two more openings were discovered when the

stomach was turned over to the right as far as possible. The stomach was supposedly empty. Prompt recovery took place after operation.

In the second case, that of the author's, the bullet penetrated the stomach of the patient after he had eaten a full meal. After entering the pelvis of the kidney, the bullet divided the right ureter, then made three perforations of the right portion of the stomach about two inches to the left of the pylorus, one in the posterior wall, one in the anterior just opposite, and another on the smaller curvature just above the line of the other two. The wound on the smaller curvature just above the line of the other two was overlooked, causing the patient's death twenty-four hours later. F. P. HAMMOND.

**Pybus, F. C.: Acute Intestinal Obstruction Due to Jackson's Membrane.** *Brit. M. J.*, 1918, i, 258.

The patient, aged forty-one, was admitted to the Royal Victoria Infirmary on January 18, 1916, with symptoms of acute intestinal obstruction.

For some years she had had attacks of abdominal pain and also marked constipation. Three weeks before admission the pains had become worse, she vomited occasionally, and had increased difficulty in getting the bowels open. For a week the pain had been severe, vomiting incessant, and there had been no action of the bowels, while flatus had not been passed for three days.

The abdomen was moderately distended and peristalsis could be felt and seen. On January 18 the abdomen was opened and free fluid escaped on opening the peritoneum. A tense cyst was found in the left iliac fossa extending into the pelvis and the *tænia coli* distinguished it as the *cæcum*. It was punctured and a Paul's tube tied in; after evacuating its contents the *cæcum* was sutured to the margin of the incision. The distention subsided and the bowels moved normally.

On February 2 the abdomen was opened in the midline below the umbilicus. The lower portion of the ascending colon was mobile and was covered by a thin membrane, at the upper border of which was a tight band passing from the parietal peritoneum to the inner border of the colon. The band tightly puckered the ascending colon. It was removed and part of the membrane stripped away. The *cæcostomy* opening was dissected free from the skin, closed, and the *cæcum* returned to the abdomen. The appendix was normal. The patient was discharged from the hospital February 17, 1916.

In August and October, 1916, she had attacks of pain and vomiting. Should these attacks persist, *cæcectomy* or short-circuiting may become necessary. V. C. HUNT.

**Wright, J. S.: Rupture of the Intestines by Blows upon the Abdomen.** *Canad. M. Ass. J.*, 1918, viii, 228.

Injury to the bowel by direct violence to the abdominal wall is possible under the following conditions: First, when the force is sufficient to



carry the abdominal wall back so that the bowel is caught between the object producing the force and the body of a lumbar vertebra. The position of the patient at the time of injury with the body inclined forward and a weak, flabby abdominal wall would predispose to this form of injury.

A second possible condition in which rupture of the bowel might occur is when it is filled by a solid or semi-solid matter that offers sufficient resistance to rupture the gut before it can recede from the oncoming object producing the sudden blow.

A third possible condition is that rupture may occur by reflex stimulation of the intestinal nerves through the nerve supply of the abdominal wall.

Rigidity of the abdominal muscles, pain of a severe type, a strained and anxious countenance, a varying degree of shock, and a rapidly increasing pulse-rate are sufficient signs to lead to a diagnosis and to indicate immediate operation. Treatment in these injuries is purely surgical, and the chance of recovery is in inverse ratio to the number of hours intervening between the time of injury and the opening of the abdomen. E. B. FREILICH.

**McDonald, A. L.: Meckel's Diverticulum as a Cause of Surgical Lesions.** *J.-Lancet*, 1918, xxxviii, 259.

On the basis of a somewhat extended review of recent literature, the author feels that certain facts can be established and certain suggestive conclusions drawn. These conclusions are as follows:

1. Meckel's diverticulum is a definite structure, and when present shows a characteristic group of possible clinical conditions.

2. Certain anomalies of the umbilicus depend on the persistence of portions of the vitelline duct, and in a considerable proportion of cases, are associated with intra-abdominal anomalies.

3. The history of such umbilical conditions in infancy is extremely important in suggesting the possibility of a Meckel's diverticulum as the cause of obscure abdominal conditions later in life.

4. In the absence of previous abdominal inflammatory lesions, bands causing intestinal obstruction should be examined most carefully for Meckel's diverticulum and treated accordingly.

5. Intussusception in older children and adults, the variety developing high in the ileum and compound forms, are frequently due to inversion of a Meckel's diverticulum, forming an intestinal polyp which may be easily overlooked.

A recent case of a male child, eight weeks old, which came under the author's observation and operation, is reported in full. E. C. ROBITSHEK.

**Pinkham, E. W.: Ileus Following Gynecological Laparotomies.** *Am. J. Obst.*, N. Y., 1918, lxxvii, 614.

The author sets down the following etiological factors for postoperative ileus: (1) mechanical irritation of the peritoneum and intestine during operation; (2) infections of the peritoneum; (3) adhesions of the intestinal loop to abraded surfaces

or to adhesion strands; (4) closure of mesenteric vessels.

His conclusions, based upon experience at the Woman's Hospital, New York, are as follows:

1. The postoperative distention which is nearly always present is likely to be a signal of danger and not a condition to be ignored.

2. Differential diagnosis is not sufficiently important to demand even one hour of delay in therapeutics.

3. The greatest source of danger in ileus is the vicious secretion of the upper small intestine caused by the failure of glandular interaction and dehydration by vomiting.

4. A strict prophylaxis includes pre-operative care, as well as a most careful attention to perfect technique at operation.

5. Early treatment at the end of twenty-four hours is indicated and early operation if non-surgical measures fail.

6. The upper bowel should always be drained and not merely punctured, the radical cure being postponed unless the patient's condition allows an extended operation. CAREY CULBERTSON.

**Laplace, E.: The Interrelation of Appendicitis, Cholecystitis, and Pancreatitis.** *Penn. M. J.*, 1918, xxi, 518.

In 1885 Pasteur demonstrated that an infectious micro-organism may have a different identity morphologically and biochemically without any change in its visible characteristics.

The effect of the infectious micro-organism upon the different tissues according to various media at different temperatures and in varying conditions of humidity increases in virulence, becomes more pathogenic and develops selective affinity. Accordingly, pathogenic organisms of very reduced virulence are used as a vaccine, whereby antibodies are produced conferring immunity against infection by the more virulent form. Thus the effect of vaccine and preventive inoculations.

Streptococcus and staphylococcus are the micro-organisms which find suitable soil in the tissues and disintegrate—the serum locally producing a toxin fatal to leucocytes. Local gangrene results when a wound is allowed to retain its pus, and observation suggests the constantly varying virulence of the streptococcus until it assumes its most virulent type. The virulence varies in passage through the bodies of different animals, and the various organs of an animal body considered as a culture soil can give the streptococcus an identity so special to a given organ that, being inoculated into another animal of the same species, it would select that particular organ as a culture medium, thereby reproducing the same disease in the second animal.

The possibility of a selective affinity of the typhoid bacillus for Peyer's patches in typhoid fever is suggested. These patients remain typhoid carriers for a long time and are prone to gall-bladder infections which predispose to gall-stones and may react as

an irritant on the gall-bladder wall and light up a new acute infection. The gall-bladder more often, however, becomes infected through the blood.

Gall-bladder infections predispose to pancreatitis and cholecystitis. The arrangement of the cæcum in connection with the appendix predisposes to cholecystitis. The infection may start with the bacillus coli and be complicated later with the streptococcus. If the infections start in weak and non-resistant subjects, they cause the acute form of appendicitis requiring immediate operation. When the local intestinal stasis has produced an infection of low virulence which assumes a chronic type, the streptococcus and bacillus coli may find selective affinity for the gall-bladder, or may nestle in the gall-bladder wall and produce cholecystitis. Thus a chain of infection starting in the ileocecal region from intestinal stasis predisposes to cholecystitis and ulcers in the stomach and duodenum.

A diseased gall-bladder, which may be judged diseased if the lymphatic glands along the cystic, common, and hepatic ducts are found swollen, may produce a subsequent pancreatitis.

A focal infection in the appendix may emerge to localize wherever it finds a selective affinity, in the gall-bladder, pancreas, stomach or intestines.

F. P. HAMMOND.

**Desmaret: Enucleation of Rectal Cancers by the Coccygo-Perineal Route** (L'ablation des cancers du rectum par la voie coccy-périnéale). *Presse méd.*, Par., 1918, xxvi, 180.

In 1908 Cunéo published his method for removal of cancers of the rectal ampulla, preserving the external anal sphincter. This technique which utilizes the coccygo-perineal route included Kocher's coccygeal method of preserving the sphincter, to which was added the pulling down of the upper intestinal extremity into the anal canal. Desmaret during the past three years has used this method in 21 cases of removal of rectal cancer, and publishes his results.

Rectal cancers may be divided into two great classes: (1) those that can be entirely palpated by the finger, i.e., cancers of the anal canal and of the lower part of ampulla; (2) cancers which can be partly palpated, i.e., those of the middle and high parts of the ampulla. The first class are favorable cases for operation because their extent can be clearly defined. The second class are unfavorable.

In cases where the operability is doubtful, Desmaret makes an exploratory transverse perineotomy. This gives an insight into the degree and extent of the lesions. It should, he thinks, be the first step of the operation for ampullar cancer situated higher than 6 cm., where the finger cannot explore. By this method cancers considered inoperable can be removed; it will also prevent the operator applying the technique of Cunéo to cases where it could only end in failure.

As an anæsthetic ether is always used; but the

author thinks that regional anæsthesia would suffice in low-situated cancers. The patient is placed in the inverse perineal position as recommended by Cunéo, the thighs being strongly flexed on the abdomen.

Operation is commenced by dissecting the mucous of the anal canal. When the cancer is high, an exploratory transverse perineotomy is done as stated.

If the cancer is in the canal and appears to involve the sphincter, he commences by perineotomy and a coccygeal incision. Transverse incision from ischium to ischium; isolation of the rectum which is easy or not according as the cancer has contracted adhesions; posterior incision and isolation of the posterior face of the rectum; separation of the rectal tube; opening of the peritoneal cavity; pulling down the terminal part of the ileopelvic colon and rectum; section of the intestine above the tumor; reconstitution of the anal canal and anus by fixation of the pulled-down intestine to the skin of the anal wall; closure of the peritoneal cavity. Each of these steps in the technique is described in detail and illustrated.

The patient is constipated for ten or twelve days following the operation. In all cases where the peritoneum has not been closed, a tampon or drain is introduced through the wound and not sutured. This is changed on the second day; and commencing with the sixth day, lavage with weak oxygenated water, later iodized water, is done. Five to six days are required for cicatrization.

The complications to be feared are peritonitis, rectovaginal fistula, and stricture.

With regard to the author's results; juxta-anal and middle ampullar cancers are benign. Desmaret's statistics include 15 cases of this variety, and there was only 1 death from pulmonary congestion.

In females operation of cancers in the superior part of the rectal ampulla offer a better chance of success than those in males on account of the easier anatomical approach. There were 4 such cases in males. In 2 of these cases it was impossible to complete the operation and the patients succumbed rapidly; of the 2 others, one died of pulmonary congestion six weeks after operation, in the other an iliac anus was necessary after a few months. There were 4 cases of high rectal ampullar cancer in females; 2 of these gave excellent results. One patient died; this was not imputable to the operation but to kidney disease. The remaining patient made a recovery with stricture.

Two recurrences have been observed among 17 cases operated upon since January, 1915, the last occurring in 1917.

Regarding the functioning of the sphincter, in four cases of cancer of the upper part of the ampulla and the rectosigmoid region the results were only mediocre. In cancers of the lower part of the ampulla the functional results were good in 15 cases followed. Stricture was observed in three. The tonicity and contractility of the muscle is, however, never normal.



The author thinks that while these patients, if otherwise operated, might have recovered, yet they would have been condemned to an iliac anus or to total incontinence. He further thinks that rectal cancers occupying the lower half of the ampulla if not too adherent to the neighboring organs ought to be removed by the Cunéo technique and that preservation of the sphincter in all cases should be the absolute rule.

W. A. BRENNAN.

**Edwards, F. S.: Fistula in Ano; Why Is Operative Interference so Often Ineffectual?** *Lancet*, Lond., 1918, xciv, 673.

The cause of failure to cure anal fistula by operation is due to one of three causes: first, the topography of the fistula is not thoroughly recognized and a part of the track of the fistula escapes division; second, caries of the coccyx or ischium is frequently a cause which escapes recognition; third, tubercle. Only the first cause is dealt with in this article.

If a line is drawn transversely across the center of the anus, external openings anterior to this plane will usually have their openings in the gut immediately opposite, and such fistulae are straight or simple. Where the external opening is behind this transverse plane, the internal opening will usually be found in the midline dorsally and between the sphincters, and with the forefinger in the rectum the indurated fistulous track can often be felt between the finger in the bowel and the thumb outside. This variety of fistula is often curved and is called a "semi-horseshoe," while a "horseshoe" fistula is merely a "semi-horseshoe" on both sides. Although a fistula anterior to the transverse line described is sometimes branched or multiple, an anterior "horseshoe" fistula is practically unknown.

A "horseshoe" fistula may have many external openings and also more than one internal opening; if so, the internal openings are situated in the midline dorsally, one above the other possibly two or three inches apart. The lower one is situated just above the external sphincter and can be felt as a depression, while the upper one usually projects into the gut and is really a granuloma.

In operating, the dorsal sphincter is divided once only, the branch sinuses layed open into this dorsal incision, and a search made for a sinus running up the bowel at right angles to this main track and joining it just outside the gut where the lateral sinuses meet. A two-stage operation should be done in extensive cases. At the first operation, all sinuses running into the main posterior track are laid open, and a month later the dorsal track into the bowel can be incised. Excision of the fistulous track and suture is not advised.

The success of the operation depends on the after-treatment which can be rendered almost painless by dilating completely the rectal sphincter, then daily dressing the wound by inserting the vaseline-coated finger into the rectum, while the patient is straining as at stool, and with pressure away from the cut, insert gently a gauze soaked in warm boric

or biniodide lotion. Do not "plug" the wound, but pack it lightly. From time to time syringe out the wound with silver nitrate solution, 20 gr. to the ounce. The patient should be gotten out of bed early and advised to take walking exercises.

P. W. SWEET.

## LIVER, PANCREAS, AND SPLEEN

**Mayo, W. J.: The Surgical Treatment of the Cirrhoses of the Liver and Their Complications.** *Tr. Am. Surg. Ass.*, Cincinnati, 1918, June.

The reaction of the liver to chronic irritation of any kind is in the nature of a connective tissue disease. The condition was first observed by Laennec, and called cirrhosis by him because of the tawny yellowish color of the atrophic form. The meaning this term carries is that of a sclerosis which perhaps more nearly represents the actual condition. This connective tissue deposit may be local or general and its morphology varies like the patterns of a carpet. There has been a tendency exhibited by many pathologists to make minute and complicated classifications based on pattern designs. But, if it is borne in mind that the liver cells are all alike, sharing equally in function, and that the natural reaction of the liver to chronic irritants, without regard to kind, is the development of connective tissue, the basic fact will be established, without being lost in a mass of morphologic detail. On the contrary, the response of the liver to acute destructive irritants, whether bacterial, toxic, or chemical, is in the nature of an acute fatty degeneration.

Cirrhoses naturally divide themselves into two fundamental groups: (1) portal cirrhosis, in which the irritants, bacterial, toxic or biochemical, are received from the intestinal tract and from the spleen by way of the portal vein, and in which the connective tissue is deposited about the radicles of the portal vein; (2) biliary cirrhosis, in which the irritants reach the biliary ducts by direct extension of infections, as from gall-stone disease or from hæmatogenous infections, usually portal, but not rarely systemic, such as those following pneumonia, typhoid fever, focal lesions, etc., and in which the connective tissue deposit is related to the biliary ducts. The many varieties of cirrhosis described are to be looked on as variations and combinations of these two main divisions.

Advanced portal cirrhosis gives rise to clinical symptoms which depend to a large extent on portal circulatory obstructions shown by the ascites, and the frequency of gastric hæmorrhages. Local portal cirrhosis may give rise to few symptoms. Jaundice is absent or a terminal condition.

Advanced biliary cirrhosis, on the contrary, depends on infections in the biliary ducts, and jaundice is an early, prominent, and often continuous feature. Ascites is absent or a terminal manifestation. Localized biliary cirrhosis may produce few symptoms.

It would appear that biliary cirrhosis is recognized



only as the late stages of a relatively frequent liver condition when more or less permanent damage to the liver tissue has taken place.

The spleen will be found to be enlarged in a high percentage of both portal and biliary cirrhoses, and it seems altogether probable that in a certain number of cases this enlargement is primary and causative. However, it is quite probable that in many cases the enlarged spleen may be a secondary manifestation of disturbed portal circulation, and that the consequent inability of the spleen to rid itself of the toxic products strained from the blood is the cause of the splenomegalia. Certainly it is often difficult to determine whether a given case is one of primary portal cirrhosis with secondary enlargement of the spleen, or of primary splenic enlargement with a secondary cirrhosis. Perhaps the nomenclature depends to a certain extent on which condition the diagnostician discovers first, that of the liver or of the enlarged spleen.

In the series of 52 cases of splenectomy for splenic anæmia, there were a number in which the liver showed portal cirrhosis. In five advanced cases, the ascites completely disappeared, and the patients gained so greatly in strength as to become well to all intents and purposes, and they have been able to work for a number of years. When it is considered that the splenic vein under normal conditions is about one-sixth the diameter of the portal vein and that in the enlarged spleen the vessels are correspondingly increased in size, it will readily be seen that the removal of the spleen in suitable cases affords a quick and certain method of relieving the portal circulation. The greatly enlarged spleen was removed in five cases of portal cirrhosis; two were of the alcoholic type. One patient died too soon after the operation to show any benefit, but the other four were very greatly relieved. As the operation of splenectomy which prevents the blood from reaching the portal vein is not one of great difficulty, it would seem to be even superior, in suitable cases, to the Talma-Drummond-Morrison method of diverting the blood from the portal to the systemic circulation through the venous compensatory channels of Sappey.

The relief of the portal circulation by reducing the amount of blood which enters the liver may also be readily and safely accomplished by the ligation of the inferior mesenteric or superior rectal vessels. A small incision is made through the peritoneal covering of the right side of the sigmoid mesentery, and the vessels are doubly ligated and divided with resuturing of the peritoneal incision. Considerable experience in such ligations, made in connection with a permanent colostomy as the first step of a two-stage removal of the rectum for cancer, has shown that an immense collateral circulation is established through the middle and external hæmorrhoidal vessels, and that the bleeding at the second stage done two weeks later is so greatly increased as to become troublesome. The coronary arteries of the stomach could be ligated safely but in the

cirrhoses this procedure might increase the ever-present danger of gastric hæmorrhage.

The Talma-Drummond-Morrison operation was performed twenty-eight times, with four deaths. Eight of the patients have died at various dates following operation, the remainder were more or less benefited; five only are in good condition. Investigation of the cases showed that good has resulted, particularly in the cases of non-alcoholic cirrhosis seen in the young, but generally speaking, the results have been disappointing. Various techniques have been employed. In a few cases subcutaneous silk drains were placed with one end entering the peritoneal cavity. In two instances the internal saphenous vein was employed in the same manner. The easiest and safest method is to make a Bevan incision, as for gall-bladder work, drawing the omentum up through the peritoneum into the rectus muscle, suturing it in that position, and closing the fascia carefully over it. On several occasions in going down a second time in the vicinity of the previous incision with a view to increasing the omental attachments, such extensive compensatory circulation, almost entirely venous, was found that it was necessary to desist and the hæmorrhage even was controlled with difficulty.

Biliary cirrhosis dependent on infections from gall-stones will usually be found complicated with chronic pancreatitis and enlargement of the spleen. The remedy which suggests itself is removal of the gall-stones and drainage of the biliary ducts. In several instances, when it seemed indicated, prolonged drainage of the gall-bladder was instituted. This apparently has been of great benefit to the patient and suggests that the source of bacterial infection was in the gall-bladder. Of late years cholecystogastrostomy or cholecystoduodenostomy has been done in selected cases and has proved equally as efficient as, and less troublesome than, the cholecystostomy. Some of the patients have been greatly benefited; many have had coincident pancreatitis which interfered with common-duct drainage, and some part of the improvement may have been derived from relief of this interference.

A large spleen connected with advanced biliary cirrhosis was removed in five instances, and the results were extraordinarily good. While none of the patients have been entirely relieved of the jaundice, and the liver has not returned to normal size, all have improved greatly.

In conclusion, the feasibility of reducing the portal circulation in suitable cases by splenectomy and similar procedures, thereby relieving the subnormal liver of its overload, is emphasized.

**Fischer, I. F.: Examination of Gall-Stones by Roentgen Rays.** *Nord. med. Ark.*, Stockholm, 1917, i, Kirurgi, No. 12.

Renal calculi as a rule are more dense than gall-stones, and produce a much stronger shadow on the roentgen plate. Also the anatomic location of gall-stones prevents them from appearing on the plate.



In the Bispebjerg Hospital, Copenhagen, for the past four years all patients presenting symptoms of gall-stones have been examined by roentgen rays. The patients numbered 141. The roentgenograms were positive in 11 cases. Of these 8 were operated upon but stones were found in 6 only. Of the 141, 54 patients were operated upon and stones were found in 39. The low positive number of cases in which shadows of stones were seen on the photographic plate shows very clearly that no weight whatever should be attached to the negative result of the roentgen examination, which showed calculi in only about 8 per cent of those examined. Even in 3 of the cases in which a positive roentgenogram was verified by operation, the number of stones found greatly exceeded those shown on the plate. This is accounted for by the fact that the calculi present in the same gall-bladder have different powers of absorption for the roentgen rays.

The author gives a number of illustrations of the appearance which gall-stones give on the plate. He also describes the errors which might be made in interpreting these shadows. The calcareousness of the stone and not its size is the determining factor in the vividness of the shadow cast on the plate.

Experiments show that no small part of gall-stones embedded in a gall-bladder with abundant gall will not be demonstrable by the roentgen rays, because their chemical composition gives them less power of absorbing the rays than that possessed by the liquid. It is impossible to fix a limit of the percentage of gall-stones the demonstrability of which is within the margin of possibility. It will depend on the technique applied. Any improvement of technique will improve the roentgenologic diagnosis of gall-stones. W. A. BRENNAN.

**Judd, E. S.: The Recurrence of Symptoms Following Operations on the Biliary Tract.** *Ann. Surg.*, Phila., 1918, lxxvii, 473.

Recurrences of symptoms following operations on the biliary tract are much more frequent following drainage of the gall-bladder than after its removal. From a review of 2,027 case histories of patients operated upon at the Mayo Clinic in the past two years for biliary conditions, 219, or 10.8 per cent, were secondary. Eighty per cent of the operations were for the removal of the gall-bladder, which has been accepted as the operation of choice, as it has been definitely shown that this reduces the risk of later troubles and ordinarily is to be preferred to cholecystostomy for drainage.

In these secondary operations the mortality was only 0.8 per cent, or no higher than in a series of primary operations. The mortality from drainage was higher than from removal, but this was due to the fact that only those cases were drained in which the patients were poor risks or where there were technical difficulties which did not make a removal possible at the time of operation.

Infection of the liver, gall-bladder, or ducts is the most frequent cause of secondary trouble, and

may recur many years after the primary operation. The recurrence of stones is more frequent in the gall-bladder than in any other part of the biliary tract. The common duct is next in point of frequency, although in a small percentage of cases stones will be overlooked in the common duct and give the symptoms of re-formation at a later date.

GATEWOOD.

**Scalone, I.: Splenectomy for Necrotic Spleen After Gunshot** (Sopra una splenectomia per ferita dell'ilo con necrosi della milza, trombosi intraparenchimale diffusa et extraperitonealizzazione per ematome perisplenica). *Policlin.*, Roma, 1918, xxv, sez. prat., 538.

In the curious case reported, Scalone did a splenectomy on a soldier 28 days after being wounded by a shrapnel bullet. There was presumably a lesion of the splenic vein. The spleen was quite necrotic and found to be outside the peritoneal cavity from which it had been pushed by a large and total perisplenic hæmatoma. There was a diffuse intraparenchymal thrombosis with marked dilatation so as to be almost cystic in appearance. The presence of small foci of infection disseminated throughout the whole spleen explained the presence of a persistent feverish condition. The man recovered.

Scalone finds no similar case in literature.

W. A. BRENNAN.

**Elliott, C. A.: Radium Treatment of Leukæmia.** *Med. Clin. N. Am.*, 1918, i, 1261.

In the treatment of leukæmia, radium possesses certain advantages over benzol or the X-rays. The general toxic action of benzol is objectionable and its results are uncertain. With an efficient roentgenologist, leukæmia cases may be improved by X-ray, but they remain clearly leukæmic as to blood picture and splenic enlargement.

Radium therapy is more readily applied, has more lasting effects, and more decisive action, and the treatment is necessary only at longer intervals.

Using four 25 mg. lead screened tubes, with one-fourth of an inch of gauze between the element and the skin, the radium is applied to the splenic circumference for two exposures of from four to six hours each the first day.

Changing the application to another portion of the spleen, this is repeated on the second and third days. In thirty days, this course is repeated, and in sixty days only 800 mg. hours may be required.

A case of myelogenous leukæmia is reported, the chief symptoms of which were splenic tumor, with local pain and tenderness, dyspnoea and general weakness, loss of weight, subcutaneous nodules, tingling sensations in the arms, attacks of jaundice, gastric indigestion, and nocturia. Using the radium therapy as above described, the patient experienced gradual relief from pressure because of marked decrease in the size of the splenic tumor, and gained in weight. The white cells dropped from 311,200

on June 19, to 26,800 on November 16. Because of a tendency to enlarge, the spleen was removed December 29.

Radium, in this case, greatly improved the patient's general condition, caused the blood picture to become normal, and reduced the size of the spleen to normal, causing a diffuse corrective increase in in the spleen, and leaving no semblance to the typical leukæmic spleen.

The second case was a myelogenous leukæmia in which radium was applied irregularly from May 26 to June 30, 1917, a total of 6,600 mg. hours. On discharge from the hospital July 3, there was a great improvement in the general condition; blood count was reduced from 294,000 to 33,000, and the spleen was decreasing in size. By March 11, 1918, the spleen was not palpable, the red count was normal, white count was 11,200, and the patient in good health.

The third case was a lymphatic leukæmia, with marked tumor masses in the cervical regions, axillæ and groins, and palpable retroperitoneal masses. The spleen and liver were somewhat enlarged. From January 11 to February 6, 1917, the patient was given seventeen applications of radium, with a total of 6,600 mg. hours. The tumor masses were reduced greatly and showed marked solution. White blood count was reduced from 113,000 to 5,400, with no pathologic cells remaining. When last seen, the condition of the patient was still improving.

The following conclusions are drawn:

1. Radium, as a therapeutic agent in these cases of leukæmia, was more effective than other methods.
2. The white blood cells rapidly approached normal with loss of pathologic cells.
3. Hæmoglobin and red blood count increased rapidly.
4. Pathologic lymphoid tissue decreased rapidly in size, and a section of the removed spleen shows no leukæmic findings.
5. Improvement has been shown in the general health of patients.

V. E. DUDMAN.

**De Lange, C., and Schippers, J. C.: Familial Splenomegaly; a Clinical Study.** *Am. J. Dis. Child.*, 1918, xv, 249.

The authors report 7 cases of splenomegaly, all in one family. The ages of the children were from seventeen days to eleven years.

The first case, two years old, had an enlarged liver but no clinical history was obtained.

In the second case, eleven years old, the spleen was enlarged, firm and painless. The left lobe of the liver was enlarged; there was no ascites. The urine contained urobilin. The Wassermann and von Pirquet tests were negative. Hæmoglobin was 70 per cent; red cells, 5,200,000; white cells, 6,800. Differential count gave 64 per cent neutrophils, 13 per cent eosinophiles, 0.3 per cent basophiles, 16.6 per cent lymphocytes, and 5.3 per cent transitional.

Death occurred suddenly after a serious hæmatemesis.

The third case died seventeen days after birth from umbilical infection.

The fourth case, eleven years old, showed similar findings as in Case 2 except a positive von Pirquet test.

In the fifth case, nine years old, the liver and spleen were not palpable. The blood findings were the same as in Case 2, with the von Pirquet test negative.

The sixth case, seven and one-half years old, showed an abdomen distended with dilated veins. The spleen was enlarged, and the smooth left lobe of the liver enlarged. There was no ascites or jaundice; Wassermann was negative; the von Pirquet was strongly positive. Splenectomy was performed in this case.

In the seventh case, five and one-half years old the abdomen was distended and there was slight dilatation of the veins. The spleen was enlarged, smooth, and not painful. The left lobe of the liver was enlarged. Wassermann was negative, and von Pirquet positive. Splenectomy was performed.

Examination of both parents and three grandparents was made. A relative lymphocytosis was found on repeated examination of the father. Other observations led the authors to believe that these were cases of splenomegaly of Gaucher. Both children operated upon are living. The microscopic examination of the removed spleens showed no pathological tissues except hypertrophy.

I. E. BISHKOW.

## MISCELLANEOUS

**Heyd, C. G.: The Differential Diagnosis of Affections of the Right Upper Quadrant.** *Am. J. M. Sc.*, 1918, clv, 703.

The differential diagnosis of affections of the right upper quadrant resolves itself into an interpretation of the various forms of "dyspepsia." In an analysis of indigestion it is found that approximately 40 per cent are due to disease within the abdomen but arising from other organs than the stomach; that 40 per cent are due to causes entirely without the abdomen, and that in only 20 per cent is there organic disease of the stomach. For all ordinary purposes of diagnosis the history still remains the keystone in the diagnostic arch of affections of the right upper quadrant. Clinically the problem is to differentiate gastroduodenal ulceration, gastric carcinoma, disease of the biliary apparatus, including pancreatitis, appendicitis, and to a lesser extent lesions of the kidney and colon.

In considering affections of the biliary tract the histories of a large number of cases will be found to present a composite picture in which four well-defined pathological stages are evidenced and which clinically may be translated into four sequential clinical pictures: (1) when the disease is confined to the gall-bladder; (2) when there are attacks of biliary colic; (3) when calculous obstruction to the common duct intervenes with jaundice; (4) when as



a result of infection or trauma to the common duct there is an associated or coincident disease of the pancreas.

The early symptoms of gall-bladder disease are vague atypical symptoms of qualitative dyspepsia. Occasionally there is an entire cessation of this indigestion, with prolonged periods of comparative gastric relief. After a variable period of time there is introduced into this picture an acute attack of pain, colic-like in type, with marked predilection for nocturnal occurrence, and usually so severe as to require a hypodermic of morphine. Its marked and distinct characteristic is that it is of maximum intensity, occurs spontaneously, has a short duration, disappears spontaneously, leaving a residual soreness along the right costal margin. When there is a colic associated with jaundice and marked by fever, leucocytosis, and occurring in that order, the diagnosis of calculous disease of the common bile duct can be made.

Chronic pancreatitis is frequently associated with gall-bladder disease and it is claimed that it is a common abdominal complaint and capable of diagnosis. Acute pancreatitis, according to Fitz, begins with intense pain, especially in the upper abdomen, soon followed by vomiting, more or less obstinate, accompanied with obstinate constipation. A normal or subnormal temperature may be present and symptoms of collapse precede by a few hours death which is most likely to occur on the second or fourth day. Pancreatic or biliary carcinoma is characterized by slow but progressively increasing jaundice not associated with colic, chills, fever, sweats, nor leucocytosis, and in its earlier stage usually devoid of pain.

Three facts stand out in the history of all regular cases of peptic ulcer: pain, time relation of pain to food ingestion, and periodicity of attacks. As a corollary to these three is the nocturnal pain of duodenal ulcer and its rather specific type of hunger pain. Variations in symptomatology depend on the localization of the ulcer.

Cancer of the stomach makes its presence known only when ulceration occurs or when there is an interference with motor function of the stomach. There is, however, no isolated or significant sign or symptom upon which the diagnosis of early cancer can be predicated. If there is any symptom that stands out as between ulcer and cancer, it is the known periodicity of symptoms in ulcer and its absence in cancer.

The outstanding features in chronic appendicitis are irregularity, variability and almost entire lack of periodicity of symptoms. E. B. FREILICH.

**Hussey, F. V.: Review of 100 Consecutive Cases of Acute Diseases of the Appendix, Gall-Bladder, Duodenal and Gastric Ulcers Which Have Come to Operation.** *Rhode Island M. J.*, 1918, xi, 75.

Delay without operation has killed many patients or caused long, painful convalescence with unsatisfactory after-results. The normal rate of mortality

in operations for appendicitis should be practically nil when done at the most favorable time, whereas now it is high. Even in cases of disease of the gall-bladder and ulcers of the stomach, it should not be much over three to four per cent.

A hundred cases were selected by the author, 76 cases of acute and 2 cases of subacute appendicitis, 16 cases of acute gall-bladder disease, 5 cases of acute perforated gastric ulcer, and 1 case of acute perforated duodenal ulcer. Of the 78 cases of appendicitis, 23 were of the acute catarrhal type; 22 of these were operated upon with no mortality; 2 refused operation and went home well from the attack. The average time in the hospital for each case was twelve days. Of 46 cases of gangrenous appendicitis, all of which were drained, 3 died. The average length of time in the hospital for each drained case was about three weeks. All cases cited had had one or more previous attacks. The excess of time in the hospital of the drained cases over what it should have been, had they been clean, was approximately ten days to each case.

The most efficacious method of treatment of these acute cases is considered to be rest in bed, starvation diet, no catharsis, ice locally, and operation after a correct diagnosis. The Murphy saline drip has been very efficacious in drained cases following operation in conjunction with the Fowler position.

From the figures quoted, the facts are that a large number of cases have had previous acute attacks or previous symptoms of chronic inflammation; catharsis in the initial stages has been used frequently; operation was on a comparatively late day of the sickness and a longer stay in the hospital of drained cases over the clean was evident.

Of the 16 gall-bladder cases, 12 had previous symptoms. The duration of the symptoms varied from three weeks to twenty years. Thirteen cases were operated upon with a mortality of 5. Of the 6 ulcer cases, 5 of gastric ulcer and one duodenal, 5 gave history of previous trouble, with a duration of from three weeks to eight years. One case of gastric ulcer and the patient with the duodenal ulcer died.

As a preventive to high mortality or serious convalescence, physicians should impress on the patient the seriousness of the condition and urge immediate operation after diagnosis warrants.

F. P. HAMMOND.

**Saint, C. F. M.: Abdominal Operations at an Advanced Operating Center.** *Brit. M. J.*, 1918, i, 473.

The center was situated in a village in advance of the corresponding group of casualty clearing stations, and because of bad roads an hour's very bad journey was saved.

The accommodation comprised part of a building without any special heating or lighting arrangements. The heating was done by oil stoves and the lighting by an acetylene plant. In the building were the operating theater, sterilizing room, and

postoperative room of twelve beds. Outside were the reception marquee and 38 extra beds. The operating theater was large enough for two tables.

With the exception of the first few days, when a second team was attached, the operative work was done by one surgical team, consisting of the surgeon, anæsthetist, sister and theater orderly. Four extra sisters were attached to superintend the nursing in the wards. At a later period three extra surgical teams were attached to the center, and the beds increased to 75.

Special efforts were made to evacuate the abdominal cases as quickly as possible from the line. When the patient arrived, if he was considered fit for operation, he was washed and undressed, morphine and atropine were administered, and no drinks were allowed. The urine was always examined before operation, and the operation was commenced one hour after the patient's arrival.

If the patient was considered unfit for operation, the usual resuscitation procedures were carried out and the patient made as comfortable as possible, heat applied and stimulants given and saline intravenously; in a few cases transfusion of blood was performed.

If the interval between wounding and admission was more than eighteen to twenty-four hours, expectant treatment was adopted. When the case was judged hopeless, the patient was made as comfortable as possible, morphine was not withheld, and fluids were allowed by mouth.

The anæsthetic administered was chiefly ether, reinforced at times by chloroform, and given by the Shipway apparatus.

The principles observed in operating were: (1) good exposure, (2) minimum retraction, (3) gentle manipulation, (4) speed, consistent with care and thoroughness.

The wound was always excised and the subsequent incision planned to obtain the best exposure of the affected area. Complete exploration was accomplished as quickly and gently as possible and treatment was as conservative as possible. No resection was done unless the affected viscus appeared damaged beyond repair or the risk of hæmorrhage seemed too great. In hollow viscera silk was used and a transverse line of sutures preferred to purse-string in holes in the gut. Intraperitoneal bladder wounds were closed with or without drainage of the extraperitoneal track, and no suprapubic cystostomy was done. In injuries of the solid viscera it was routine to "bipp" all tracks with the object of controlling sepsis. Catgut was always used for suturing. In injuries of the hollow viscera, if the extravasation of contents was small, all that was done was local cleansing and mopping out with 1 in 1,000 flavine. If on the other hand extravasation was great, the peritoneum was irrigated with 1 in 10,000 flavine or saline, and a pelvic drain left in for forty-eight hours.

There was no hesitation in leaving a smearing of "bipp" in any area which appeared soiled. As a routine the incision was "bipped."

When both the chest and abdomen were involved, the essential feature of the operation was dealing with the abdomen through the diaphragm from above; the diaphragm itself was repaired from the thoracic aspect.

Before leaving the theater, if the patients were much shocked, an intravenous infusion of saline was given. The injection which proved most satisfactory was composed of 3 per cent gum acacia, 1 per cent glucose, and 1.9 per cent sodium chloride. On coming from under the anæsthetic, everything was done to stimulate patients. Fluids were urged by mouth or bowel, depending upon the part of the alimentary canal injured.

The average length of stay of patients at the advanced operating center was a fortnight. Of the 50 cases, 33, or 66 per cent, recovered and 17, or 34 per cent, died. The average time of all cases before operation was eight and one-half hours. Excluding one case, which was forty-two hours old, the average was seven and six-tenths hours. The average time among the recoveries was seven and three-tenths hours, and that among the deaths eight and three-tenths hours.

V. C. HUNT.

**Richards, O.: The Selection of Abdominal Cases for Operation.** *Brit. M. J.*, 1918, i, 471.

The percentage of patients who survive operation is no real index of the value of treatment. In a large number of cases injuries are found which no surgery could cure; in others there are minor injuries which would not have proved fatal even if they had been left alone. The only kind of operation which is profitable as well as successful is one in which a fatal injury is cured. These constitute the real successes.

The real failures are the cases in which the patient is wrongly classed as moribund when operation might have saved his life, and those in which a penetrating wound of the abdomen is not recognized as such until it is too late. The difficulty lies rather in the selection of cases, and it is here rather than in any point of technique that most difference exists in the practice of individual surgeons.

Men who reckon every case moribund which has been wounded for more than twelve hours, or has a pulse of 120 will be able to show good statistical results. Those who operate on practically every living patient will waste much energy, and have a high death rate; they will, however, save a few more lives. A hopeless abdominal case is only injured by operation in the sense that life may be shortened by a few hours, while an exploration which proves unnecessary is rarely fatal. But every unprofitable operation means that time is wasted, and that other wounded have to wait longer. Every hour wasted makes the chances of all those waiting for operation definitely worse.

Wounds limited to solid organs, with no progressive bleeding, and no large missile retained, do not usually need operation, and patients with other grave injuries of head, chest, or limbs are commonly unfit to stand it.



In the vast majority of the remainder it can usually be recognized that the abdomen is penetrated. Here the abdomen is opened on the ground that most men wounded in this part of the body die, but that some of them can be saved by operation. Whether operation is necessary or not can only be discovered by exploration, but if it is necessary, the exploration is fully justified. Under these conditions decision in each case must be based on the time elapsed since injury, and the condition of the patient, of which the best index is the pulse.

In this series the time which had elapsed since the injury was recorded in 164 cases; 120 were operated upon within twenty-four hours, and 44 cases later. The recovery in the early cases was 40 per cent and 19 per cent in the later. Of the late cases only 7 had wounds of the alimentary canal, so that out of 19 successful cases operated upon after twenty-four hours only five were men wounded in the stomach or intestine. The rest of the survivors had injuries with hæmorrhage from a solid organ, mesentery or omentum.

In the early cases 80 were operated upon within twelve hours; 33 recovered. Of these 26, or 80 per cent, were wounded in the stomach or intestines. The survivors, with or without operation, are almost all cases whose chief injury is hæmorrhage. Bleeding has by this time ceased and is not necessarily fatal if left alone. In these late cases, then, there is greater chance of performing an unnecessary and unprofitable operation. It seems that operation is very profitable in the first twelve hours and well worth while in the second twelve hours. After this time the chances are that it is unnecessary, even if the patient survives, so that preference should be

given to early cases, even if their condition is less good.

The cases may be divided into those with a pulse-rate under 120, and those with a rate of 120 or over. The quality of the pulse is very important. Of 131 cases in which the pulse was counted, in 77 it was under 120, and 54 per cent recovered. Of the 54 in whom it was 120 or over, only 25 per cent recovered.

The objection to risking death on the table is largely sentimental. If the patient is as fit as he is ever likely to be, and has a reasonable chance of surviving the operation, this danger may be faced.

If care is taken to exclude those who have been wounded too long, and those whose condition is too bad, there still remains the danger of failing to include those who have scarcely any symptoms. Minute wounds of the abdominal wall without pain, rigidity or vomiting, are sometimes associated with serious internal injuries. In these cases the results of operation before symptoms occur are very good. To avoid missing these cases it is necessary to explore every wound of the abdominal wall.

A sensible surgeon should be in charge of the pre-operative ward, whose duty it is to decide the order in which cases go to the theater, and, if necessary, the surgeon to whom they are allotted.

Waste of time should be eliminated in getting patients in and out of the theater, anæsthetizing and cleaning them. If there is a sufficient supply of stretcher bearers and if two tables are available for each surgeon, so that he may go from one patient to another, this delay can be obviated.

Speed in operating is important. Provided an operation is gentle and thorough, the quicker it is done the better.

V. C. HUNT.

## SURGERY OF THE EXTREMITIES

### DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS, CONDITIONS COMMONLY FOUND IN THE EXTREMITIES

Earl, G.: *Bursæ. Minnesota Med.*, 1918, 1, 131.

Anatomically a bursa is not a distinct organ. Histologically, there is a wall of connective tissue with elastic fibers partially or wholly limiting a colloid substance. It may be lined with a pavement epithelium, or a tissue rich in round cells and cells similar to cartilage cells.

One hundred and seventy-five bursæ are listed and in many cases there are multiple bursæ under one name. While trauma was formerly thought to be the all-important factor, increasing recognition has been given to the rôle of infections and other factors as metabolic disturbances. Many of the bursæ connect with the synovial membrane of the joints and are accordingly subject to the same diseases.

Calcium deposits are frequently shown in bursæ,

suggesting the diagnosis of bursitis. The chief value of the radiogram is, however, in the exclusion of bony changes. These deposits must not be confused with fragments of bone about a joint.

The treatment of bursæ depends upon their etiology and location. The superficial type lends itself readily to aspiration or excision. In the deep type conservative treatment calls for rest, aspiration, massage, and passive movement. It may be necessary, however, to resort to excision, or in the presence of a pyogenic infection, to incision. The rôle of the focus of infection must not be overlooked, not only in effecting a cure, but as an etiological cause of further disturbance.

GATEWOOD.

Kirmisson, E.: *Scapular Osteomyelitis* (Sur un cas d'osteomyélite de l'omoplate) *l. Rev. gén. de clin. et de thérap.*, Par., 1918, xxxii, 132.

A scapular location of osteomyelitis is rare. Statistics show 9 in 661 cases. The author reports a case in a boy aged eight years, developing consecu-

tive to a whitlow of the index finger. Two similar cases are found in literature. The patient has been treated by lavage of Dakin's fluid. If the suppuration does not abate, resection and removal of sequestra will be done.

W. A. BRENNAN.

**Ramey, R. L.: Report of a Case of Osteitis Fibrosa Cysticus, Involving the Shaft of the Right Femur and Right Tibia.** *Texas St. J. Med.*, 1918, xiv, 16.

The author reports in full a case in a child nine years of age. The diagnosis was made chiefly by X-ray.

At operation, the unhealthy tissue was thoroughly curetted out, and the cavity swabbed with half strength iodine and closed. The femur was treated the same as the tibia.

The author reports the child to be in good physical condition at the present time.

E. C. ROBITSHEK.

**Wobus, R. E., and Opie, E. L.: Elephantiasis; Report of a Case.** *J. Am. M. Ass.*, 1918, lxx, 987.

A case of elephantiasis of unknown etiology is reported.

An unmarried woman aged forty had progressive enlargement of the right foot since an early age, which had become progressively worse, with muscular weakness becoming more marked and locomotion more difficult.

Various methods of treatment were of no avail. The leg was amputated below the tubercle of the tibia. Examination of the specimen showed a pendulous mass, completely surrounding the bones of the foot and protruding posteriorly at the calf. Cross section showed a tumor almost completely replacing the gastrocnemius, and consisting throughout of dense white fibrous tissue.

Microscopic examination showed also dense white fibrous tissue poor in cells, especially evident in the immediate vicinity of the blood-vessels. Occasional islands of fat intervened.

The lesion was diagnosed as elephantiasis dura.

V. E. DUDMAN.

**Willems, C.: Immediate Active Mobilization as a General Method in Articular Lesions** (La mobilization active immédiate-méthode générale de traitement des lésions articulaires). *Arch. méd. belges*, 1918, lxxi, 225.

Willems says that no surgical procedure has been so dogmatically established as that of immobilization in articular lesions. Within recent years, however, the teachings of Lucas-Championnière, Rochard, and others have done much to replace immobilization by progressive movements. Willem himself who practised immobilization in plaster for twenty-five years has found generally that the results were not brilliant. At the German Surgical Congress of 1908 he reported about 30 cases of hæmarthrosis or traumatic hyarthrosis treated by evacuatory puncture and early mobilization, which

attracted a large amount of attention and gained a large number of followers for this method.

The war has opened up a vast field for the application of the method. The technique cannot be invariably the same for lesions which are materially different. Thus immediate walking is impossible in the case of a large knee puncture. The nature of the joint mobilization may vary according to the case, but the general rule is active immediate mobilization. Active mobilization depends upon the patient himself, who must make the physiologic movements of the joints. Such active mobilization cannot be replaced by passive mobilization, which does not involve either the musculature or the nutrition of the limb. Neither should the two methods be combined. Active mobilization should also be immediate, commencing from the time the patient awakes from the anæsthetic. The mobilization should be pushed to the maximum degree of motion possible from the very beginning and continued without respite.

The treatment of articular lesions, therefore, according to Willems, should consist of active, immediate, maximum, and uninterrupted mobilization of the joint. It requires that the patient must continually make the necessary efforts, and he therefore must not be left to himself but must be supervised by a staff conversant with the method.

Whatever may be the extent of the bone lesion, Willems says that mobilization is always possible, although not always in the same degree. It requires courage and perseverance in the patient, but the necessary movements though tiresome do not cause any real pain.

Willems passes in review the various types of articular lesions and shows in what manner and measure the foregoing principles may be applied in each case. The types of lesions reviewed are joint lesions without bone injury; joint lesions with slight bone injuries; joint injuries with medium, and those with extensive bone injuries; cases with extensive losses of substance of one or of both epiphyses; epiphyseal fractures of various types.

The method is only applicable within certain limits of osseous destruction, beyond which it is impossible to preserve the function.

Immediate active mobilization has given the most surprising results in purulent arthritis. Willems states that this new method is infinitely more powerful than any other available means of combating this infection. Drainage of an articulation by the existing methods is, according to the author, impossible; none of the means at disposal ever succeed in accomplishing it in a sufficient manner. To practice resection in such cases is to go beyond the indications.

But after a preliminary arthrotomy, when the patient makes movements which can be done almost without pain, the pus is expelled sometimes in jets. When the movements are continued, the pus is expelled as fast as it is formed and articular drainage is fully and satisfactorily assured. The formation



of peri-articular abscesses is unknown, and the general state undergoes rapid improvement. Articular mobility is also preserved and there is no ankylosis. As the joint becomes dry, the arthrotomy openings are closed up. Movements are not more painful for the patient with purulent arthritis than in the case of a non-infected lesion. When the temperature has fallen sufficiently and while the articulation is still largely open, the patient is made to walk.

In future articles the author will give particulars of cases and statistics.

W. A. BRENNAN.

### FRACTURES AND DISLOCATIONS

**Simpson, J. A.: Traumatic Luxation of the Sacro-iliac Symphysis, Without Fracture of the Pelvis.** *Ann. Surg., Phila.*, 1918, lxxvii, 348.

Simpson reports a case of luxation of the sacro-iliac symphysis combined with separation at the symphysis pubis, in which reduction was accomplished by use of the Hawley table and applied traction, and secured by wiring and by an adhesive plaster band, over which a cast was applied.

Only eleven well authenticated cases have been reported.

Diagnosis of this condition with the X-ray is easy; without it, difficult and uncertain.

On the affected side shortening of the limb is noted when measured from the umbilicus, and no shortening when measured from the anterior superior spine, this resulting from release of the innominate bone from its attachment to the sacrum.

The limb is externally rotated, with toes everted.

Severe shock attends this condition. The injury to the viscera and blood-vessels is the chief cause of death, the bladder being wounded most often.

V. E. DUDMAN.

**Couteaud: Prognosis of Gunshot Fractures of the Thigh** (Du pronostic des fractures de cuisse par coup de feu). *Bull. Acad. de méd., Par.*, 1918, lxxxix, 352.

Experience in former wars created the opinion that the prognosis of gunshot thigh fractures was always very grave. This is no longer true. Of 250 thigh fractures treated in the Cherbourg Hospital during the war, 215 were open gunshot fractures. There have been 31 deaths. These 215 fractures, two-thirds of which were diaphyseal, occurred in 213 patients, two of whom had both limbs smashed. Of the 182 survivors, 38 are entirely cured; 92 resumed active service; 21 recovered with a more or less useful limb; and 31 have been mutilated.

Some of the deaths and deformities have been due to concomitant lesions. There have been 61 amputations, disarticulations, etc., and a large number of esquiectomies for osteomyelitis. Of the 31 deaths, 27 occurred during the first six months of the war.

Complete functional activity of the thigh has been re-established in only 20 per cent of the cases;

recovery with slight shortening and sufficiency of play in the joint has been obtained in 50 per cent; there were mutilations in 17 per cent and a more or less defective limb in 11 per cent. There were 6 pseudarthroses, 4 shortenings greater, and 17 less than 10 cm. Several cases of exuberant callus have been noted.

Infection is the chief danger in thigh injuries, especially gaseous gangrene. Of 15 patients so attacked the author has been able to cure 6. When the section of the amputated bone is yellow, the prognosis is bad.

All forms of septicæmia are seen in thigh fractures. Phlebitis of the superficial veins of the limb is less to be feared than that of the deep vessels. It has caused numerous sudden deaths after only a slight effort.

Four patients died from hæmorrhage. Tetanus was a complication in 5 cases and caused 3 deaths. Even if there is recovery, coaptation of the fractured fragments cannot occur. Lesions of the sciatic nerve were observed 9 times.

W. A. BRENNAN.

**Hall-Edwards, J.: Fracture of Sesamoid Bones.** *Arch. Radiol. & Electrotherap.*, 1918, xxii, 381.

The author's attention was directed to the probable existence of this lesion by his roentgen findings on the foot of a man who had suffered an injury some years ago and subsequently had much pain in the great toe-joint. The sesamoid over the metatarsophalangeal joint of the great toe showed distinct fragmentation. Although realizing the possibility of multiple sesamoid bone formation, he believes his case was one of fracture on account of the rough appearance of the opposing edges. The case is noteworthy on account of the scarcity of mention of the condition in the literature.

ADOLPH HARTUNG.

**Rouvillois, H., and Guillaume-Louis: The Treatment of War Fractures** (A propos du traitement des fractures par projectiles de guerre). *Bull. et mém. Soc. de chir. de Par.*, 1918, xlv, 516.

The authors' experience indicates that while primary suture is the ideal in war fractures, it is not always realizable and has its contra-indications. The first contra-indication to primary suture after surgical cleansing is a long period of time elapsed after injury. In shell wounds the development of virulent infection renders suture dangerous. Although in some cases they have succeeded in suturing a wound sixteen hours old, yet they think generally that this should not be done after twelve hours.

The character of the wound may be a contra-indication. Very comminuted fractures, particularly when the muscular attrition is extensive, and especially in the thigh region where the thick muscle masses do not ensure a complete clearance of injured tissue, ought only to be primarily sutured with great care. The existence of a vascular lesion is an absolute contra-indication to primary suture.

Vascular gangrene is frequent and the dead muscle is a most excellent culture medium for microbes. Multiple wounds should be considered a contra-indication to primary suture.

When such contra-indications do not exist, the authors primarily suture after rigorous and complete surgical cleaning and lavage of the area with alcohol-ether. The progress of the wound is under constant bacteriological control. This is necessary to success, as the clinical signs do not suffice. In favorable cases the evolution is aseptic and the stitches can be drawn by the eleventh day. But even if partial removal of sutures be necessary owing to the development of a slight infection, the ultimate prognosis is greatly modified and the fracture is greatly benefited by the partial closure. There are cases, however, which in spite of the most vigorous sterilization develop infection. It is necessary to reopen, drain, and chemically sterilize. The authors employ Dakin's solution, Delbet's magnesium chloride, or a soap solution.

W. A. BRENNAN.

**Ferguson, R. S.: Incomplete Outward Dislocation of the Knee.** *J. Am. M. Ass.*, 1918, lxx, 1213.

Outward dislocation of the knee is a very uncommon injury. In the case reported, the injury was produced by a direct blow above the external condyle of the femur, while the patient was standing. Such a blow causes an oblique tear of the internal ligaments and joint capsules and rupture of the anterior crucial ligaments. The intact posterior crucial ligaments cause outward rotation of the leg. The limb is held rigidly extended. The internal condyle of femur is projecting. The patella rests on the lateral aspect of the external condyle. The external tuberosity of the tibia is displaced out and back. The internal tuberosity of the tibia is in line with the external condyle of the femur. The entire external articular ridge of the tibia can be palpated. There is extreme pain.

Reduction under anæsthetic is accomplished by complete flexion of the knee and hip, the left hand of the operator behind the tibia, with the thumb on the external margin of the patella; the right hand is at the ankle. The lower leg is now internally rotated, traction being made on the tibia and the leg extended. The patella is next slipped into place.

Extension is made for four days, followed by immobilization in plaster. Massage is given after the first week. A perfect result was obtained in six weeks.

LISTER TUHOLSKE.

**SURGERY OF THE BONES, JOINTS, ETC.**

**Mayo-Robson, A. W.: Conservative Surgery of the Hand as Illustrated by a Case of Tendon Grafting.** *Brit. M. J.*, 1918, i, 257.

In November the author was called to see a weaver, thirty-two years of age, with a view to amputating his right arm for an injury caused by machinery.

The whole of the inner side of the forearm up to the elbow was hopelessly crushed and lacerated, exposing the ulna from one end to the other, but not opening the elbow-joint. The muscles were torn and the bone rasped bare of periosteum. The wrist-joint was opened and the inner row of carpal bones was crushed. The three inner fingers were hopelessly smashed and the whole dorsum of the hand was swept clean of skin and tendons except the extensors of the thumb, which were bared but not otherwise damaged.

The index finger, excepting that its metacarpal joint was opened and that its extensor tendons had been completely torn away, was not further injured. The author decided to save the radius, the radial half of the carpus, and the thumb and index finger, and make an extensor indicis from the flexor tendon of the smashed middle finger.

The ulna was excised to within a short distance of the elbow, the inner side of the carpus was removed together with the three inner fingers, the skin of their palmar aspects being saved to lap over and cover the dorsum of the hand. The flexor tendon of the middle finger was taken out of its sheath and four and a half inches of it detached and placed over the site of the extensor indicis, the proximal end of the tendon being stitched to the fleshy belly of the extensor communis digitorum, the distal end being fixed to the small portion of tendon left near its insertion into the phalanx. The skin was brought over to cover as nearly as possible and no drainage was employed. The wound pursued an aseptic course and the patient returned home within a month and was advised to try to use his finger and thumb.

He returned to his work in February and was able to perform his work as a weaver as well as ever. The movements of the fingers were good, both in flexion and extension, the wrist-joint was movable, and both supination and pronation could be effected.

V. C. HUNT.

**Babcock, W. W.: Interilio-Abdominal Amputation; a Description of a New Method, with Report of Three Cases.** *Surg., Gynec. & Obst.*, 1918, xxvi, 554.

In a well illustrated article the author gives reasons for, advantages of, and a description of the technique of this operation. The following advantages are pointed out:

1. The practically absolute provisional hæmostasis without additional incision or apparatus.
2. The facility with which amputation may be carried out under local anæsthesia with a minimum of shock.
3. The removal of all the skin and deep tissues of the thigh, the flaps being formed above the level of Poupart's ligament and the gluteal fold.
4. The removal *en masse* of the amputated part, the lower abdominal wall, the inguinal and deeper pelvic lymphatics with the adjacent fascial planes and soft tissues.



5. The restoration of a strong abdominal floor and anterior abdominal wall.

6. The use of a single relatively small posterior or postero-external flap with ample blood supply.

7. If necessary, the removal of part or all of the innominate bone.

The technique of the operation does not lend itself well to a brief abstract, but is well worth the consideration of those interested.

C. C. CHATTERTON.

**Mouchet, A., and Pamart: The End-Results of Arthrotomy of the Knee** (Résultats éloignés des arthrotomies du genou). *Bull. et mém. Soc. de chir. de Par.*, 1918, xlv, 768.

The authors have been able to follow and observe the functional results in 54 cases of arthrotomy of the knee. Six gave excellent results; 15 were good, i.e., complete extension and flexion reaching 90 per cent; 14 fair results, flexion being less than a right angle and extension not equal to normal; 19 poor results. The statistics therefore show 39 per cent of good results; 25 per cent fair and 35 per cent incomplete results with more or less ankylosis. These patients were treated for a year at least.

The authors think the results on the whole satisfactory — and that they can be made more so if the operated cases are submitted to a less rigid and less prolonged immobilization; if they are assured of continuous necessary care in special hospitals; and if surgeons at the front reserve the large U-arthrotomy for such extensive injuries as require ample light in operating.

W. A. BRENNAN.

**Cofield, R. B.: Treatment of Septic Arthritis.** *Ohio St. M. J.*, 1918, xiv, 149.

Suppurative arthritis may be the result of a penetrating wound into or near the articulation, or it may be the sequence of a focal or general infection originating in some distant part of the body. It is on this latter condition that Cofield bases his paper.

Frequently this form of arthritis is encountered developing during the course or following an attack of scarlet fever, pneumonia, gonorrhœa or typhoid fever. In the great majority of acute joint infections nothing is encountered more severe than a synovitis with or without effusion, which readily clears up with conservative treatment.

An acute suppurative arthritis may be secondary to a serous synovitis or it may start without any obvious serous stage. When it follows a serous effusion the symptoms gradually increase in severity, the swelling and pain become more marked, redness of the joint becomes evident, the temperature usually rises, and aspiration of the joint cavity discloses a cloudy or purulent fluid. It may be septic, ushered in with chills, high temperature, pain, swelling, and loss of motion eventually. The diagnosis can be made by the withdrawal of fluid from the joint with an aspirating syringe. X-ray is of little value in the

early stage. Later when the cartilages have suffered in the destruction and bony changes have taken place, a roentgenogram may aid in the prognosis and influence the treatment.

In the great majority of cases synovial fluid is found to be sterile. The result of some experiments carried out by Wherry, of Cincinnati, has led the author to believe that the infection must be located within the synovia and para-articular structures and that the effusion is purely reactionary to the inflammation within these tissues.

Efficient treatment of septic arthritis depends, first, upon a thorough disinfection of the joint structures, and second, complete immobilization of the joint in a proper position. Cofield calls attention to the fact that he had unsatisfactory results in using the method advocated by Murphy, namely, the aspiration and injection of two per cent formalin in glycerin. He calls attention to the fact that Dyas in experimenting with rabbits found that both cultures and smears from septic joints previously treated with two per cent formalin solution still showed the presence of streptococci.

The author is of the opinion that Dyas' results prove conclusively that two per cent formalin in glycerin was not efficient as a joint disinfectant. In his practice he has not hesitated to do an arthrotomy wherever necessary, but warns that either aspiration or arthrotomy should be done under the strictest aseptic precautions. His method of treating these septic joints is to inject five per cent phenol solution followed by fifty per cent alcohol, and that by normal saline. In gonorrhœal joints a normal saline solution maintained at a sufficiently high temperature to kill the organisms, about 115° F., has proven efficient. In the more recent cases he has used 1:15,000 bichloride in normal salt solution, flushing for fifteen minutes and ending with a normal saline.

He believes that complete immobilization of the affected joint in a proper position is of equal importance in securing satisfactory results, and that gentle passive motion with baking and massage will often hasten recovery, but at first the utmost gentleness is necessary in order to minimize the risk of exciting a recrudescence. The absence of signs of inflammation does not assure the absence of pathogenic organisms and well meant efforts may set up an active condition within the joint if passive motion is begun too soon. Immobilization may be secured by means of well padded splints or plaster-of-Paris casts, but no undue tension should be put upon the capsule.

The fibrous adhesions that form may be broken down by force after all inflammatory signs have subsided, but a complete anæsthesia should be used for this. Sudden, jerking movements should be avoided. After the adhesions have been broken down, the joint should again be immobilized, but removed from its dressings daily for massage, and both active and passive movements persistently carried out.

G. W. HOCHREIN.

**Gaudiani, V.: Kineplastic Amputations.** *Ann. Surg.*, Phila., 1918, lxxvii, 414.

In 1896 Vanghetti by a series of ingenious experiments on animals tried to demonstrate that the muscles of an amputated member when properly covered by skin and protected from retraction can preserve their function of voluntary contraction. Although the opportunities in civil practice have not been very great for the development of this method, a sufficient number of kineplastic amputations in various forms have been performed to make it evident that transmission of voluntary movements to an artificial member is of distinct value in the replacement of the function of a lost limb.

This method should be applied whenever possible, especially in the amputation of the upper limb, and even though not possible at the time of operation, the possibility of a future kineplastic transformation of the stump should be borne in mind. Such secondary operations should be favored, and possibly performed, in institutions where at the same time the artificial member could be constructed and fitted. Of course this method is not available in old stumps in which the muscles have atrophied and lost their power of contraction.

The after-care of such amputations is all-important, as it should attempt to prevent secondary retraction. This has been done by keeping tension on the muscles by a silk suture passed outside of the wound and attached to the dressings or to an extension apparatus. Massage and exercise must be begun early.

GATEWOOD.

### ORTHOPEDICS IN GENERAL

**Campbell, W. C.: Operative Measures in Infantile Paralysis.** *Texas M. J.*, 1918, xxxiii, 396.

The early treatment as well as late operative measures of treatment of infantile paralysis are considered.

Orthopedic treatment should begin as soon as the diagnosis is made. Rest and protection are advocated until the nervous symptoms disappear. There should be no weight bearing on the paralyzed limbs for from three to six months.

Apparatus should be used, along with massage, electricity, and muscle training for at least two years from the date of onset. Operative measures are discussed under: (1) correction of deformity; (2) limitation of mobility; (3) restoration of function; (4) restoration of balance.

All these measures may be necessary in restoring even a simple case. The author illustrates his paper with photographs and many brief case histories are given.

C. C. CHATTERTON.

**Gottlieb, A.: Prevention and Treatment of Localized Muscular Contractures.** *Calif. St. J. Med.*, 1918, xvi, 254.

The causes of muscular contractions and their prevention and treatment are all briefly considered.

The prevention of muscular contraction the author believes is best done by mobilization of neighboring joints to secure rest to the injured part.

He believes in the shortest possible time fixation that is necessary and advocates early massage and exercise.

Treatment of developed muscular contracture is divided into mechanical and operative. Most cases can be cured by mechanical measures alone. Before mechanical measures are used, he advocates that the part be exposed either to radiant or connective heat, to light or electrically generated heat.

Exercises are taught and given manually.

C. C. CHATTERTON.

**Smith, E. H.: Arch Defects of the Human Foot.** *Calif. St. J. Med.*, 1918, xvi, 256.

The author describes various defects of the arches and suggests treatment.

In small children often an absence of bones or delayed ossification of bones accounts for the so-called weak feet in childhood.

The common type of broken arch is really a weak foot, which if allowed to continue, will result in bony changes and a flat foot.

In the organic type, the foot is rigid and bony changes take place which are extremely difficult to cure. Traumatic flat-foot is not uncommon. Infection may cause flat-foot. Paralytic conditions of muscles cause a separate class of flat-foot deformity.

Many types of shoes, supposed to be curative, he believes are useless and harmful.

He discredits some of the bone operations now in vogue. He believes in over-correcting flat-feet with plaster-of-Paris dressings, and uses in his own practice felt and leather pads which he finds are more satisfactory than the arches now on the market.

C. C. CHATTERTON.

**Mayer, L.: The Treatment of Flat-Feet.** *Med. Rec.*, 1918, xciii, 811.

From experimental work during the past three years, the author has found a foot plate which seems to him to meet all physiological requirements for the correction of flat-feet.

The technique is simple. No plaster model is necessary. An impression of the feet is taken and a paper pattern cut from the model. The inner side reaches to a point just behind the bearing area of the first metatarsal bone; the outer side to a point just back of the head of the fifth metatarsal. The inner side is made convex with the most prominent part, the scaphoid. From this paper form a celluloid model is cut and boiled to permit shaping. Experience is necessary to mold the celluloid model to meet all the requirements of correction. The anterior end must conform to the transverse arch. It must be convex from side to side.

It is advisable, the author states, to allow the patient two to three days to try out the celluloid model before a leather-covered metal plate is made as a permanent brace.

JOHN MITCHELL.



## SURGERY OF THE SPINAL COLUMN AND CORD

**Couteaud: Spinal Injuries of War** (Des traumatismes rachidiens de guerre). *Bull. et mém. Soc. de chir. de Par.*, 1918, xliv, 728.

The author has treated 42 spinal war injuries. In 12 of these there was section of the cord and all of these were rapidly fatal. The general mortality was 47.6 per cent. The diagnosis of a projectile in the spinal column, although facilitated by the X-rays, needs a skilled clinician. About two-thirds of the cases show effusion of blood in the spinal cavity. But although this may be the case, spinal puncture may be negative.

If section of the cord is incurable, hemisection is not necessarily fatal. Many fractures cure by rest. When there is an intravertebral projectile, especially in the canal, it calls for prompt operation. An early laminectomy is best for the patient and easiest for the surgeon. Risks of infection and compression of the cord are least for the patient and the bone is more manageable. It is perhaps difficult to overcome hæmorrhage, and the copious use of adrenalin in the canal is indicated. After exposure of the cord the use of a general anæsthetic may be dispensed with and medullary discontinuous anæsthesia adopted without risk.

Short histories of several cases are given.

W. A. BRENNAN.

**Hassin, G. B., and Carroll, E. P.: Sacral Tabes with the Clinical Picture of a Lesion of the Conus Medullaris; Report of a Case.** *J. Am. M. Ass.*, 1918, lxx, 755.

In tabes dorsalis the pathological changes are usually confined to the posterior roots of the dorso-lumbar region. Yet there are cases which affect chiefly the cervical, lumbar, or sacral regions. As a rule the lesions are segment-like as evidenced for instance by the simultaneous occurrence in the majority of tabes cases of lost tendon reflexes, Argyll-Robertson pupil, cerebral nerve involvement, anæsthesia of the chest, etc. But cases are occasionally seen in which the lesion can be localized from the clinical picture.

In the case reported by the authors there was exclusive involvement of the conus medullaris producing a classical picture. The patient was a male of forty-two years, with a six-year history of urinary and faecal incontinence and painless chronic ulcers on feet and buttocks. There was also girdle pains at the level of the hips and numbness from the umbilicus down. There was complete saddle-like anæsthesia of the perineum and adjacent parts. There were none of the other common symptoms of tabes. Blood and spinal fluid were Wassermann negative. There was no history of trauma.

Autopsy study, besides revealing typical syphilitic lesions elsewhere, showed a typical tabetic involvement of the sacral cord only, especially the last three

segments. The case is the only one on record and suggests that some cases of so-called conus lesion may be nothing but tabes. C. A. HEDBLÖM.

**Hughes, D. M.: Laminectomy for Gunshot Wound; with a Record of Three Successful Cases.** *Brit. M. J.*, 1918, i, 280.

A gunshot wound of the spine may produce a complete or incomplete lesion of the cord. A complete lesion is evidenced by flaccid paralysis with loss of reflexes and sphincter control, and denotes that a complete interruption of the impulses in the tracts of the cord has occurred. In incomplete injuries the missile hits the spinal column, but the theca is not hit by the missile or the displaced bone, and the resulting paraplegia may be: (1) quite transitory and flaccid but apparently complete; (2) may only appear after an interval; or (3) may or may not have a transitory period of flaccidity with completeness merging more or less rapidly into a spastic condition of any degree. These three conditions may be caused by: (1) concussion; (2) intraspinal, subdural or intramedullary effusion; (3) granulation tissue about a sinus or retained missile; or (4) callus.

The indications for operation as given by Makins from experiences in the South African campaign are: (1) excessive pain in the area above the paralyzed segment, for relief of immediate suffering, (2) a recovering lesion which seems due to fragments of bone or missile encroaching upon the spinal cord.

As to prognosis, there will not only be spontaneous recovery in concussion which produces a shock resulting in cessation of function of the whole cord, but a large number of spastic paraplegias also improve or recover with rest. The gravest sign is flaccid paralysis which entails complete loss of function of the sphincter, motor, and sensory tracts below the lesion. If transitory, the prognosis will be good; if persistent, it will be bad. The slow progress of caries paraplegia gives good opportunity for prolonged observation, and a definite involvement of the nerve tracts is seen; disturbance in motion occurs first, then very soon sensation; but a considerable degree of impaired sensation may exist with but slight loss of motion. Sensations however are usually lost before the sphincters are affected. In recovery sphincter activity returned first, then sensation, and lastly motion.

In five of the author's cases the missile was in the spinal canal and all were complete cases. In three the missile was removed with no improvement of the patient. In four there was flaccid paralysis and laminectomy was done for girdle pains or to remove foreign bodies; no improvement resulted and one died. Three had spastic paraplegia of different degrees and all made complete recovery and complete return of health. In each case a de-

gree of sepsis was present. Case 1 was postponed on account of sepsis of the emergent bullet wound until it was thought inadvisable to put off the decompression longer. This laminectomy wound made a primary healing. In Case 2 pus was encountered in the callus in the spinal canal and the wound drained for a few days. In Case 3 the operation was undertaken in the presence of a freely discharging sinus leading to the body of the vertebra and in this case a mild localized myelitis retarded the recovery.

In Case 1 the paralysis was slight at first and increased in severity. In Case 3 the paralysis was present at first and improved considerably before operation. In Case 2 paralysis came on suddenly nine weeks after the injury in a patient apparently well. In each one of these three cases the sphincters were not involved, damage was done to the spinal column but not to the cord itself, and recovery was complete. The dura was not opened in any case.

P. W. SWEET.

## SURGERY OF THE NERVOUS SYSTEM

**Delagenière, H.: Surgical Treatment of Nerve Wounds; Operative Technique and Results of 245 Cases of Suture and 113 Liberations** (*Traitement chirurgical des blessures des nerfs; technique opératoire et résultats de 245 cas de suture et de 113 libérations*). *Bull. et mém. Soc. de chir. de Par.*, 1918, xliv, 522.

The author's report is based on the results obtained by Tinel in his neurological clinic. At the time of injury the nerve may be either completely sutured with the two ends in the wound, the fibers in both ends being infiltrated with blood, or the injury may be such that though physiologically the function is suspended, section is not complete. When the wound is cicatrized and the nerve is exposed, there may be any of four types of lesions: (1) compression or simple strangulation; (2) burial in a fracture canal; (3) complete or incomplete interruption by a cicatricial fibroma; (4) complete interruption by section with or without loss of substance.

Every nerve wound, whether it is a perforation, notching, or section, with or without separation of its extremities is almost always a neuroma, or pseudo-neuroma. A neuroma is found on the central end; a pseudo-neuroma on the peripheral end. Both are obstacles to regeneration and must be resected and the freed axis-cylinders of both ends put in contact. In the case of sensory-motor nerves the fibers must be exactly approximated when sutured. The sensory fibers in both ends must meet in the sheaths to which they correspond, and similarly with the motor fibers.

The technique is easily deduced from these general considerations. At the time of injury if the nerve is found completely or almost completely sectioned, a freshening of the ends or a slight resection followed by suture must be immediately done. Such immediate sutures give excellent results and even if they should fail, a secondary resection can be done later when the wound is healed. In a late operation after cicatrization, after disclosing the nerve a careful dissection is made above and below the site of lesion and endeavor made to find the portions above and below which correspond, so as to avoid malposition of the axis-cylinders.

Minute dissection will show whether it is merely

a question of compression. The neuroma of the central end and the pseudo-neuroma of the peripheral end are searched for and resected. The diseased parts of the nerves are sectioned by fine-cutting scissors starting from the center of the lesion and progressing toward the healthy part of the nerve. Approximation of the stumps is aided by flexion of the limb. This flexion in addition to traction on the nerve, according to the author's experience, can obviate 10 cm. of shortening in the sciatic, 6 cm. in the radial, 5 for the median, and 2 to 3 for other nerves.

Suture of the two ends is made by separate stitches of fine silk or linen with non-cutting needles. Four to six stitches suffice. Catgut should never be used. If the two ends cannot be approximated, recourse must be had to grafting. Musculocutaneous grafting has given the author 3 complete successes. For some time suture has been done in two stages. In a first operation as much as possible of the diseased nerve is resected but enough of the solid fibrous tissue is preserved to make a suture of these tissues. By this means a progressive elongation of the nerve is obtained. A later second resection is then made under very good conditions. The sutured nerve must be placed in tissue as normal as possible. Wrapping the nerve in pieces of artery sheath, rubber, metal, etc., are bad procedures as they isolate the nerve from living tissue and engender atrophy or resorption. The author has put the nerve in a piece of split neighboring muscle in an interstice of the aponeurosis. If the suture has been done in a flexed limb, the limb must be maintained flexed in a plaster cast from a month to six weeks.

In young patients in good general condition the author finds nerve regeneration to be effected at the rate of 1 to 1.5 mm. per day after suture.

In 245 cases of nerve suture and graft followed for more than two and a half years, there were 181 sutures done under good conditions with 120 excellent results, 41 fair results, and only 20 failures, or more than 80 per cent positive results and nearly 70 per cent excellent results. In 55 cases the suture was done under bad conditions, such as insufficient freshening of the stumps, imperfect coaptation of the fibers, or coaptation in a septic area. In these



55 cases there were 6 excellent, 18 fair results, and 31 failures.

Nerve suture, therefore, correctly made under good conditions is almost always followed by success. In this respect the author draws attention to the condition in the neurological clinic of Tinel in which the patients were under long careful post-operative supervision with the addition of every necessary after-treatment, massage, faradization, etc. This is an essential part of the successful results of nerve surgery.

In 9 cases with very large loss of substance the author used musculocutaneous grafts. There were 3 almost complete successes and 6 incomplete results. When approximation of the two separated ends is impossible, the author has never seen regeneration.

It is difficult to determine the duration of regeneration. In the radial nerve complete regeneration has been observed after four months when the suture was early and in good condition. In the same nerve under different conditions it has required thirteen months or more.

Liberation of a nerve, except after a simple compression, always gives a functional result inferior to that obtained after resection and suture. The opinion of Tinel regarding liberations is quoted: "It is very difficult to form an opinion of the value of nerve liberations. We have done relatively few

because it has seemed to us that they do not generally give better results than abstention." Delagenière says that, emboldened by the almost constant success of nerve suture, it has been the practice for the past eighteen months in severe neuritis to section and suture the nerve. The procedure has given excellent results.

W. A. BRENNAN.

**Young, J. K.: Gunshot Wound of the Posterior Cord of the Brachial Plexus.** *Boston M. & S. J.*, 1918, clxxviii, 501.

The author describes a case of gunshot wound resulting in paralysis of the right arm. A bullet had passed under the middle third of the clavicle, with its path of exit through the infraspinous area of the scapula, fracturing the fourth rib posteriorly about two inches from its attachment to the vertebræ.

Neurological analysis of the case resulted in a diagnosis of laceration or division of the posterior cord of the brachial plexus, and operation was performed to restore the continuity of the cord. Of the three routes, division of the clavicle, division of the pectoralis minor, or operation through the axilla, the second was chosen. This revealed the cord in this region surrounded by inflammatory products, but not divided. The patient subsequently had full restoration of function in parts supplied by this cord.

V. E. DUDMAN.

## MISCELLANEOUS

### CLINICAL ENTITIES—TUMORS, ULCERS, ABSCESES, ETC.

**Ribas y Ribas, E.: The Treatment of Cancer** (*Tratamiento del cancer*). *Rev. de cien. méd.*, Barcelona, 1918, xlv, 1, 41, 81.

Ribas y Ribas draws the following conclusions on the treatment of cancer:

As regards biologic and biochemic conditions:

1. That a precancerous state exists.
2. That metabolic products of the cells, altered in their relations with the surrounding media, are highly irritating and act upon the cells and connective tissues.
3. That the chemical products of the cells play an important part in the cellular development and multiplication and these phenomena, and may be provoked by the administration of chemical substances. Glucogenesis and the presence of lecithin are connected with the cellular hypernutrition and multiplication of cancer.
4. That the organs of internal secretion have an important influence on the malignant neoplasm.
5. That the blood of cancerous patients constantly shows modifications: acidosis, leucocytosis, antitryptic power increased; diminution of glycolytic ferments and hæmolytic power.
6. That general defences of the organism exist: phagocytosis; the hepatic function forming fer-

ments destructive to the malignant cell; defensive ferments throughout the entire organism, freed by spontaneous as well as provoked autolysis.

7. That the neoplasm provides local defences; degenerations; hæmorrhage, hyalinosi; concomitant sclerosis.

As regards immunity:

1. It is seen experimentally that a natural or acquired immunity to cancer exists.
2. That such immunity may be modified by alimentation.
3. That injection of malignant neoplasm does not give a specific immunity.
4. That the resistance and immunity acquired are temporary and when long are accompanied by hypertrophy of the liver and spleen.
5. That individuals are observed in the clinic refractory to cancer in spite of exposure to the known predisposing causes.
6. That cancerous families exist commonly showing only arthritism, which is thought to be a favoring means of transmission of a suitable medium for development of cancer, although the heredity transmission of the neoplasm is denied by the majority of authors.
7. That there is an immense biological field open for biochemic and cellular study in order to explain the resistance to cancer and to find the means of modifying and increasing this resistance.

As regards prophylaxis:

1. There is a cancerous territory probably prepared by arthritis, diabetes, syphilis, chronic intoxication, excess of fat and albumin in food, etc.

2. This fully demonstrates the existence of precancerous conditions, of precancerous territories provoked by chronic irritations, traumatic or chemical, and chronic inflammations.

3. Therapeutic prophylaxis will have as its object (a) to modify the cellular metabolism; (b) to suppress all causes of chronic irritation; (c) to watch for and remove any precancerous lesion.

As regards curative treatment:

1. In the actual state of knowledge a surgical intervention should be made as soon as cancer is diagnosed, and preventive therapeutics should be practised.

2. Roentgeno- and radiotherapy are in order and ought to be combined. There are very notable successful results from these agents in cancer of the uterus and skin cancers.

3. Chemotherapy ought to be combined with radio- and roentgenotherapy.

4. The beneficial modifications obtained by vaccines authorize their employment.

5. Organotherapy should be tried when there is a proved deficiency of the functioning of the liver or an internal gland.

W. A. BRENNAN.

**Masson, P.: Botryomycotic Gunshot Wound** (Plaie de guerre botryomycosique). *Lyon chirurg.*, 1918, xv, 230.

Masson describes a case of botryomycosis in a gunshot wound, a thigh fracture, which confirms Magrou's researches on the etiology of this disease. Histological examination of the fistulous cicatrix of the wound showed œdematous granulation tissue with numerous capillaries lying in sclerous connective tissue. There were isolated or fused small nodules in both regions. The nodules included many mononuclear leucocytes and near the center an increasing number of polynuclear leucocytes.

The center was formed of a drop of pus imbedding two kinds of foreign body: (1) necrosed bone spicula; (2) strange little bodies containing a granulated substance and surrounded by a thin refracting membrane. The two types of foreign body, differing in appearance, have the same nature; the small sequestra include colonies of cocci which become free by necrosis and resorption of the protecting bone spicula. The microbe colony then covers itself with a thin refracting coat to protect itself from contact with pus. The colonies of gram-staining microbes recall the features of granules of actinomycosis or of botryomycosis of the horse.

Masson believes that the disease, erroneously called botryomycosis, is in reality a reaction of the organism against the staphylococcus. Magrou's experimental researches showed that the botryococcus was not a distinct species, but was identical with the staphylococcus doré. If this agent is injected in massive doses into the testicle of a guinea-

pig it causes necrosis of the organ before there is time for effective leucocytic action; if injected in small doses the parasite is destroyed by the leucocytes; if injected in medium doses the action of parasites and leucocytes are equalized and the staphylococci collect in granules in the midst of the inflammatory area. They become adapted to the new conditions of life and form a protective covering.

The formation of granules, which was observed in Koch's bacillus, in actinomycosis and actinobacillosis indicates only the symbiotic adaptation of the cocci to the host. Masson calls attention to the practical point of his case; if the pus had been examined by the Carrel method the examination would have been negative in spite of the fact that the wound was filled with numerous microbes included in the granules.

W. A. BRENNAN.

**Bayliss, W. M.: Intravenous Injection in Wound Shock.** *Brit. M. J.*, 1918, i, 553.

Wound shock is preferable to the names "surgical" and "traumatic" shock. Primary and secondary stages are differentiated. Primary shock occurs immediately on receipt of the wounds, and is in many ways similar to an exaggerated fainting. Secondary shock occurs after partial recovery. Low blood-pressure and its consequences are the most general and obvious signs of secondary shock. The immediate cause of low blood-pressure, apart from hæmorrhage, is still obscure. The following conditions can be excluded as causative factors; acapnia, adrenal exhaustion, exhaustion of nerve centers, inefficient action of the heart, paralysis of arterioles or veins, especially of the abdominal area.

The hypothesis of "exæmia" of Cannon (accumulation and stasis of blood in capillary areas, so that it is removed from currency as effectively as if lost to the exterior) finds the most favor.

The effects of insufficient blood supply owing to low blood-pressure are multiple, and it is a combination of several of these that gives the bad results and these are exaggerated by hæmorrhage. A high blood-pressure itself is not the principal object, but rather an increase of the blood and oxygen supply to the tissues. Consequently the use of vasoconstrictor drugs is to be deprecated. Blood transfusion does not appear to be of any more value than other solutions. A fall of one-third in blood-pressure means a fall in blood supply by two-thirds or more. Ringer's solution has been found to be useless, both experimentally and in actual practice. Hypertonic and isotonic saline do not give the best results. The addition of calcium is too transitory and is undesirable.

As to acidosis, the blood never becomes really acid but a part of its normal bicarbonate content becomes neutralized by combination with some fixed acid (lactic, etc.) produced in the tissues on account of defective oxygen supply. The results described as produced by acidosis are those due to a rise in the hydrogen-ion concentration. Ex-



perimentally, Bayliss has found that as much as one-third to one-half of the bicarbonate can be combined with fixed acid without the production of any increase in the hydrogen-ion concentration of the blood. Acidosis is not in itself a serious factor in shock, and alkaline injections are uncalled for. Solutions of salts in general are merely of temporary value, and likely to be followed by a greater fall in blood-pressure. Gelatin and gum arabic are the only two colloids serviceable. Gelatin is not practical because of the danger of containing tetanus spores, and it may cause intravascular clotting.

Gum arabic is used in 6 per cent solution and maintains the blood-pressure indefinitely in both wounded men and animals. It does not leave the blood-vessels and is innocuous even in a volume equal to one-half the total blood volume (1½ liters in man). It produces no hæmolysis nor agglutination in man and does not increase the viscosity of the blood. Commercial products contain small amounts of calcium and potassium salts, so all that is needed is the addition of 0.9 per cent of sodium chloride and tap water to make 6 per cent of gum arabic. This must be filtered through flannel or some other convenient medium and then sterilized. Its value is best shown after hæmorrhage, but will be of no avail when the bulbar centers have permanently lost their excitability. It should be given as early as possible.

Conditions in which gum arabic injections have been found of value are: severe hæmorrhage from abdominal wounds and from arteries; cases in which hæmorrhage and shock were not excessive, but in which a dangerous fall in blood-pressure followed operation; other cases in which there was severe shock, but only slight hæmorrhage. Some of these were complicated by gas gangrene, and one case of this infection in which there was neither shock nor hæmorrhage, but a blood-pressure of only 70 mm. Hg., recovered after the blood-pressure had been restored by gum.

The general conclusions drawn are that the main factor in the successful treatment of wound shock is to ensure an adequate supply of blood, that is, of oxygen, to vital organs, especially to the nerve centers. This is most simply done by intravenous injections of gum solution, which does not appear to be in most cases inferior to blood. When very great hæmorrhage has occurred, it would seem reasonable that blood transfusion should be done.

If the use of sodium bicarbonate is thought necessary, it is best given by stomach or rectum. But it has not yet been demonstrated that the symptoms relieved by bicarbonate would not be more effectively cured by raising the blood-pressure. In principle it would seem to be a mistake to reduce the slight increase of acidity of the blood, since this is of value in stimulating the respiratory center, and there is no evidence that the slight increase of hydrogen-ion concentration which is present in some cases of acidosis, but not always, is in any degree harmful in itself.

CARL R. STEINKE.

**Delaunay, H.: Intravenous Injection of Locke's Serum with Gum Arabic in the Treatment of Severe Hæmorrhagic Hypotension and Shock** (Sérum de Locke gommé en injection intra-veineuse, dans le traitement de l'hypotension des hémorragies graves et du shock). *Lyon chirurg.*, 1918, xv, 211.

Low blood-pressure alone may cause death after a serious hæmorrhage, and massive infusions of saline solution, though raising the blood-pressure momentarily, are powerless to save the wounded. These patients have lost the greater part of their serum proteins which Delaunay thinks is the chief cause of fatal exhaustion. The ideal treatment of this kind of shock would be an infusion of fresh blood serum with all its proteins. But this method offers many difficulties and Delaunay has attempted to replace blood serum by Locke's solution with the addition of gum arabic. The results have been highly satisfactory. After a severe loss of blood the injection of gummy serum gives a remarkable reanimation which is in every way identical with the results with blood serum provided that the blood lost has been previously replaced by saline or glucose solution. The gum arabic acts like the proteins, raising and keeping up the blood-pressure.

The author has studied the physiological action of gum on the circulatory system. It seems to act by viscosity, increasing peripheral resistance, and by osmotic pressure. The clinical effects have been observed in animal experiments and in 3 cases of serious shock in human subjects. In posthæmorrhagic shock the results are excellent if the vasomotor nervous system is not exhausted and the lost blood is replaced as above; on the contrary, if the system is exhausted even when the loss of blood is insignificant, injections of gum and serum as well as direct transfusion are powerless.

The Locke and gum arabic solution is prepared as described below. Precautions must be taken in sterilizing by boiling because if the fluid is boiled with all its constituents there will be a precipitate of carbonate of calcium. The two following solutions are therefore prepared and separately sterilized by boiling, then mixed when required. The solutions may be prepared in ordinary and strong grades according to the quantities given:

#### FIRST SOLUTION

	Ordinary Solution	Strong Solution
Gum arabic.....	30 gr.	50 gr.
Chloride of sodium.....	8 gr	6.5 gr.
Chloride of potash.....	0.2 gr.	0.8 gr.
Bicarbonate of soda.....	0.2 gr.	0.5 gr.
Glucose.....	1 gr.	1.5 gr.
Water.....	990 gr.	990 gr.

#### SECOND SOLUTION

	Ordinary Solution	Strong Solution
Chloride of calcium.....	0.2 gr.	1 gr.
Water.....	10 gr.	10 gr.

The maximum injection of the Locke and gum solution should not exceed 150 ccm. W. A. BRENNAN.



**Mottram, J. C., and Russ, S.: A Contribution to the Study of Dosage in Radium Therapy.**  
*Arch. Radiol. & Electrotherap.*, 1918, xxii, 309.

The authors present a very complete study of the action of the radium rays on secondary carcinomatosis. The case was one of glandular carcinoma of the breast of the schirrous type in an unmarried woman, aged fifty-three, the breast lesion having been present for seven years. Four years following the appearance of the primary lesion there was a development of numerous nodules under the skin of the head and trunk. Following the appearance of the skin nodules, she was subjected to X-ray treatment with no benefit.

At the time of the beginning of the radium studies, the patient was wasted and pale. The left breast presented at the site of the nipple a small, puckered ulcer, covered with a dry crust. Numerous cutaneous nodules were present, varying in size from a half inch in diameter to minute nodules only palpable with difficulty. Several hard nodules were found on the scalp, giving rise to bald patches. There were no enlarged lymphatic glands, and no other evidences of secondary growths.

The changes in the skin resulting from exposure formed a progressive series and were described under the following headings:

Erythema varied from a faint pink to a deep dusky discoloration. It was often the only skin change following exposure to radium, and in no case have other skin changes been observed not preceded by erythema.

In a few cases a transient œdema was observed six hours after exposure, more especially when intense sources of gamma rays were employed.

Scaliness and pigmentation commonly succeeded the primary erythema. In many cases, however, these changes were masked by the more profound changes, such as exudation, following large doses of radium. Pigmentation often persisted for many months. In a few cases, the erythema was followed by the formation of a shallow blister, which either dried up or became a moist surface discharging serum. In a great number of cases, the irradiated area became covered with a heaped-up dry exudation or crust, resulting from the slow discharge of serum, which dried up as quickly as it was discharged. In other cases, the rate of discharge of serum did not permit of its drying locally, and thus a moist surface resulted. In a few cases in which the injury was more severe, the discharge of serum from the moist surface was blood-stained.

In all these, skin reactions were followed by healing, but in many cases, permanent alteration of the skin resulted; there was either partial or complete destruction of the hair.

If ulceration of the skin had occurred, accompanied by either a dry exudation or a moist surface, then after healing a permanent absence of pigmentation was frequently observed; this was associated with a thin, glossy, hairless skin, as is often seen in the scars following other skin injuries. A final

permanent change in the irradiated skin consisted in the formation of dilated venules; this was always accompanied by leucoderma, and only followed the severe ulcerations.

The author has conveniently classified his studies under the following heads:

1. Comparison of the effects of beta rays, according as a large quantity is used for a short time, or a small quantity for a long time. The time taken for the reactions does not vary appreciably, whether the exposure be two or six hours, but the degree of such reaction corresponds with the length of exposure. There is much less effect upon the skin when it is exposed for a long time to a weak source than when a strong source is used for a short time.

2. Comparison of the effects of screened beta rays under various conditions of irradiation. The same reactions were obtained when no filter was used as when one millimeter of aluminum was used, adjustment having been made by varying the time of exposure. This finding is analogous to that reported in 1.

3. Comparison of the effects of gamma rays over a wide range of intensity of radiation. This study was made by covering the capsule with a millimeter of lead, as radium so covered emits mainly gamma rays. This necessitated increasing the exposure from two hours to about five and a half days in order that the top layer of the skin shall actually absorb the same amount of energy. Such an exposure is just as effective in causing the disappearance of the nodules as the shorter exposure to unscreened rays, but the reaction of the skin was much less. When the quantity of radiation is increased so that the exposure is a matter of hours, the effects upon the skin are not less but rather more pronounced when gamma rays are used than when unscreened radiation is employed, explained by the fact that when the surface equality of beta and gamma rays is established, the layer at a depth of five millimeters will be actually absorbing about nine times as much gamma ray energy as that of the beta plus the gamma type.

4. Comparison of the effect of unscreened beta and gamma rays upon the skin and subcutaneous nodules, over a wide range of intensity of radiation. The general trend of the results is to confirm those which figure in 1, 2, and 3. The times taken for the different phases of the same reaction to appear do not vary very much with the dose administered, but the degree of such reaction does. When a small quantity of radiation is administered for a long time, there is far less disturbance of the skin than when a large quantity is applied for a short time.

In the explanation of these findings, the authors suggest that they are bound up with a series of changes which form the cycle of the cell's life, that is, growth to maturity, division, and growth once more. It has been shown by several observers that the stage of cell life represented by division is an especially vulnerable one to radiation. Mottram has shown that the ova of *ascaris megalocephala* are



about ten times as vulnerable when in the dividing stage as in the growing stage. From studying the progress of a rapidly growing sarcoma of a rat, it was concluded that even in this rapidly growing tumor, it would be necessary to give the exposure over four days, in order that all of the cells should receive irradiation during the phase of division.

W. A. EVANS.

### SERA, VACCINES, AND FERMENTS

**Van Saun, A. I.:** *The Wassermann Reaction with Diabetic Sera.* *J. Med. Research*, 1917, xxxvii, 205.

In the course of a number of routine Wassermann examinations it was possible for the author to note the result of the Wassermann reaction on sera obtained from diabetics. As many workers have contended that diabetic sera gave non-specific reactions with Wassermann antigens; that sera from diabetic patients with no syphilitic history frequently gave false positives, it seemed to the author that perhaps the record of her experience with such sera tested in the course of the performance of the Wassermann reaction on over ten thousand specimens received during the year 1916 might be of interest to those engaged in serological work. In her work all sera were tested in duplicate and with two antigens.

Seventy-three sera were received from patients with a known history of diabetes. Almost all of these sera were chylous, and many of them extremely so. This appearance she states is frequently observed in sera from diabetics, since in this disease the fat content of the serum is usually abnormal.

Only one serum gave a positive reaction, fifty-one were negative, two doubtful, and with nineteen the serum controls failed to hemolyze, so that no readings could be made. All the sera giving the so-called anti-complementary results were chylous.

The one serum which gave a positive result was obtained from a patient who had also a history of syphilis.

The sera with which doubtful reactions were obtained gave only weak fixation. One of these sera was obtained from a patient who gave a history of a chancre twenty-six years previously. The other patient gave no history of syphilis.

These results with sera from cases of undoubted diabetes seemed to the author to dispose of the contention that diabetic sera give readable positive reactions with Wassermann antigens when there is no clinical evidence of syphilis, and that with carefully controlled tests non-specific fixations can always be checked. The nineteen sera giving non-specific reactions in this series of tests might easily have been supposed to be positive, had not their anti-complementary qualities been fully demonstrated by the double as well as the single serum controls.

GEORGE E. BEILBY.

### BLOOD

**Loeb, L.:** *The Organization of Blood-Clots After Auto-, Homo-, and Heterotransplantation.* *J. Med. Research*, 1918, xxxvii, 353.

Former investigations have shown the differences in the behavior of connective tissue and lymphocytes of the host toward various tissues, as well as the differences in the fate of the introduced tissues after auto- and homotransplantation. In these cases tissues that had an active metabolism of their own were dealt with. The author thought it of interest to compare with these tissues the behavior of blood-clots after auto- and homotransplantation. While it may be assumed that in red blood-cells after transplantation oxydative processes may still proceed for a certain time, it is improbable that in erythrocytes continuous specific metabolic activities take place under those conditions. It seemed to him of interest to determine whether blood-clots also would elicit a specifically different reaction after auto- and homotransplantation. He furthermore added to these studies experiments in which blood-clots of the rabbit were introduced into the guinea-pig, which corresponded to heterotransplantation. Possibly the greater strangeness of the blood of a foreign species was able to produce reactions similar to those of actively metabolizing tissues after homotransplantation, he states.

Guinea-pigs were used in his investigations, which were primarily undertaken with a view of studying comparatively the reaction of the host tissue towards identical and strange cells, although they are also of interest as a contribution to the study of the process of the organization of blood-clots.

The author distinguished two kinds of organization of the blood-clot: (a) the provisional, and (b) the definite one. The provisional organization consisted in the ingrowth of more or less isolated fibroblasts into the coagulum. This ingrowth took place as long as there was left some remnant of unorganized coagulum. In the dense coagulum a certain number of fibroblasts perished. The remnants of nuclei seen in the coagulum and the large number of fibroblasts seen at early stages as compared to some later pieces suggested such a conclusion. The author considers it very probable that what appeared as a simple clot was a mixture of clot and "fibroplasm." Some of the fibroblasts became transformed into fibers in the clot. How many of the fibers of the clot were fibrin and how many were transformed fibroblasts was difficult to determine. Constantly new fibroblasts grew into the coagulum, using the fibers of the coagulum in their wandering, their way paved by the dead bodies of the fibroblasts which preceded them.

Different pieces were organized with varying rapidity. These variations were in part dependent upon variations in the size of the original blood-clot. In addition, it was probable that the organization proceeded with different rapidity in different

animals. The remnants of the blood-clot gradually became smaller in all cases. Seventeen, eighteen and twenty days after the introduction of the clots the amount of coagulum still unorganized had diminished considerably, and the number of pieces in which no clot was seen had increased. At last he found merely fibrous tissue in which were embedded cells containing blood pigment. These pigmented cells were the last vestiges of the blood-clot.

In most pieces he found inside the connective tissue capsule, and surrounding the clot proper, blood which seemed to have been shed more recently, probably from the capillaries which were newly formed in the surrounding fibrous tissue. He considered it possible that these hæmorrhages occurred at the time when the clots were removed from the animal.

Mitoses occurred in both the fibroblasts in the capsule around the clot as well as in the fibroblasts entering the clot. They occurred also in epithelioid cells which were formed in the clot.

The fibroblasts not only moved into the clot and organized it, but through their kinetic power they tore off superficial parts of striated muscle on which the clot rested and pushed these pieces further up toward the clot. At the same time they sometimes succeeded in bending and turning the muscle and splitting it into smaller particles. Thus these muscle particles were found far removed from their original position, and they were gradually transformed into fibrinoid material, hard to distinguish in appearance from true fibrin. It may be assumed, the author states, that the muscle thus attacked was already injured from the beginning.

Throughout the process of organization, cells which migrated into the clot now and then took up erythrocytes and transformed them into pigment. These cells lay between the fibers and assumed often a round form. They also sometimes seemed to destroy fibrin in the clot, and to act as "fibrinoclasts" in a manner comparable to the action which osteoclasts exert toward bone.

At certain places in the clot he observed at various periods of the process of organization epithelioid and giant cells. In the epithelioid cells he found blood pigment and also the giant cells took up pigmented cells lying in their neighborhood. These epithelioid and giant cells formed at places where the clot was especially dense and offered resistance to the progress of the cells, probably fibroblasts. At such places he very often found the clot changed, the pigment appearing in brown, yellow, or greenish colors.

Lymphocytes were nowhere very prominent in the guinea-pig clot. He often found very small collections of lymphocytes in the fibroblastic-fibrillar or hyaline tissue which surrounded the clot. They were found especially around blood-vessels and sometimes around the nerves in the neighboring tissue. Here they probably filled lymph-vessels accompanying the nerve; they were also found

among the fibroblastic tissue invading the clot. They were absent in both auto and homo pieces sometimes, and were sometimes present in both. When present, they were always found in small numbers.

The author feels justified in concluding that in contradistinction to kidney and thyroid, in which homotransplantation called forth different reactions in the host, the homo character of the blood-clot did not elicit a specific response on the part of the host. In case a response was called forth, it was quantitatively so slight that it was not comparable to the effect of thyroid and kidney tissue. He therefore concludes that this homo response was produced through the vital specific metabolic activity of tissues and not through the splitting of the tissues, or through such oxydative processes as perhaps occurred in the erythrocytes of blood-clots. The homo toxins were produced through the vital metabolic activity of tissues and not through their disintegration.

Heterotransplantation of blood-clots (transplantation of rabbit clots into guinea-pigs) differed in the following features from auto- or homotransplantations: (a) The amount of fibroblastic tissue surrounding and organizing the coagulum seemed to be more extensive. Capillaries penetrated into the clot at an early period. (b) The clot itself underwent changes which indicated certain processes of solution; especially were cavities frequently found in the clot. (c) The infiltration of the organizing fibroblastic tissue with lymphocytes was more pronounced than in the case of auto- and homotransplantation of blood-clots. However, in different pieces the number of lymphocytes present varied. (d) The number of polynuclear leucocytes present in the clots and in the surrounding fibroblastic tissue was greater than in the case of auto- and homotransplantation of clots.

GEORGE E. BEILBY.

**McCann, F.: Suggestions for the Prevention of Postoperative Thrombosis and Embolism.**  
*Brit. M. J.*, 1918, i, 277.

Sepsis is the most important causative factor, but intravascular clotting apart from sepsis does occur. Transfixion of blood-vessels in mass ligation McCann believes is a more or less unrecognized and preventable predisposing cause. A ligature so introduced, that is infected or that becomes so, may arrest the natural process of clotting and the clot may liquefy and become detached in whole or in part. Transfixing ligatures should, therefore, never be used. Blood-vessels in the broad ligament and omentum, for example, should be picked up and tied separately. Similarly care should be exercised in making incisions in such a way as to as far as possible avoid large vessels. In all operative work sutures should not be tied so tightly as to cut into the blood-vessel and accurate hæmostasis should be achieved, leaving no blood-clots as potential foci for infection.

C. A. HEDBLÖM.



## BLOOD AND LYMPH VESSELS

**Gatellier: Some Considerations upon Vascular Wounds with Reference to a Case of Arterial Intubation.** (Quelques considérations sur les plaies des vaisseaux à propos d'un cas d'intubation artérielle). *Bull. et mém. Soc. de chir. de Par.*, 1918, xlv, 437.

In a series of 123 ligatures of various vessels there were 20 recoveries in cases which on being received did not show any state of hæmorrhagic shock. In the 103 other cases there was some hæmorrhagic shock, and of these after ligation 96 recovered and 7 died. Eight secondary amputations were necessary. The secondary amputations were distributed thus: In 5 axillary ligatures there were 3 secondary amputations; 2 iliac ligatures gave one amputation; 18 femoral ligatures gave 3 amputations; 11 posterior tibial ligatures gave 2 amputations. Thus although ligature saves the life it does not always preserve the limb. Gatellier therefore sought some method better than ligature.

He found the opportunity in a case with a high popliteal wound with ischæmia of the limb, rapid gangrene threatening. There was a large loss of substance in the arterial wall which was torn over half its circumference. Attempts to suture were impossible. The wound was washed with warm serum, clamped above, and the region surgically cleansed. The artery was washed out with serum and a paraffinated silver tube introduced by the breach, the artery being sutured over the extremities with catgut, and the clamp removed. Pulsation was at once felt in the vessel below the tube. Five hours after operation the limb which previously showed all the signs of threatened gangrene was warm and rosy. The next day the toes recovered their sensation. Seventy-two hours after operation when collateral circulation was well established, the tube and arterial segment were removed. There was not the least sign of necrosis nor any signs of clotting.

With the exception of this one case of intubation, all other vascular injuries were ligated in healthy non-contused tissue.

Gatellier does not find good results from ligation at a distance. In his 123 ligatures he had secondary hæmorrhage occur only once. W. A. BRENNAN.

## ROENTGENOLOGY

**Armstrong, R. B.: The Part X-Ray Plays in the Treatment of Cancer.** *J.-Lancet*, 1918, xxxviii, 190.

When diagnosed early and before metastasis has taken place, and when in an accessible region, thorough removal of cancer by surgical means is primarily indicated. Often a patient will return after a time with the adjoining parts breaking down or with a metastasis.

Of late years much has been done to help to attain a good recovery by the use of the X-ray and radium. By new and improved technique and apparatus it

has become possible to give the roentgen ray in much more massive doses and hundreds of times the former radiation. Every particle of matter penetrated by the X-rays absorbs X-rays of varying quality and quantity, becomes radio-active and gives off minute rays itself, secondary rays.

The X-ray acts upon the molecular, atomic, or subatomic structure of the tissues. The results may be recognized clinically as stimulation, irritation or loss of tissue. The characteristic and unique action of the X-ray is the production of cell degeneration; the action is local and reaches every cell in the irradiated area. The selective action of the X-ray is the basis of roentgen therapy. Diseased cells or tissues are more sensitive to the X-ray than normal tissues, and abnormal cells are especially susceptible to irradiation. Pathologic tissues composed of young, rapidly growing cells of low vitality do not offer great resistance to the X-ray. Sarcomata are very sensitive to irradiation. Post-operative irradiation gives the patient the best chance for ultimate recovery when given as soon as possible after operation and repeated two or three times during the year following.

One must guard against toxæmia or acidosis, and it is best to give alkalies in large doses before or after massive radiation. The treatments must not come too close together. Care must be observed in the filtration of the secondary rays, and not less than three millimeters of aluminum and one-fourth of an inch of sole leather used. Frequent urinalyses, blood-pressure readings and blood examinations should be made, and during the treatments the room should be carefully ventilated.

Where operation is not advisable, X-ray may prolong life, give comparative comfort and may even arrest the advancement of the disease. In deep cancers perhaps the cross-fire method is the most effective. By the perfected technique the number of burns has been reduced. The patient must be protected with coverings impervious to the ray and the dosage carefully regulated.

The Coolidge tube permits the passage of enormous quantities of current for long periods of time, resulting in the emission of great quantities of roentgen rays. V. C. HUNT.

**Case, J. T.: A Brief Summary of the Indications for Roentgenotherapy.** *J. Mich. St. M. Soc.*, 1918, xvii, 133.

The author gives his technique and methods of treatment in various lesions which have shown themselves amenable to X-ray therapy.

In general all chronic skin lesions which have resisted other means of treatment are benefited by X-ray therapy. It was formerly the custom to use soft tubes but now the author prefers to use hard rays even for many skin lesions because in some cases the disease extends into the deeper layers of the skin, to reach which the harder X-rays are needed.

The X-ray is indicated in few, if any, acute skin lesions, unless it be a stubborn case of weeping



eczema. Even in chronic lesions X-ray therapy should not be employed unless the case has shown itself resistant to ordinary means. It is very important to inquire of the patient whether previous X-ray applications have been made, to bear in mind the possibility of the case being luetic, and to make certain explanations regarding some of the dangers of X-ray therapy in order to be forewarned in case of an untoward reaction.

It is now recognized as a general rule in all roentgenotherapy, with the exception of malignant cases, that a definite reddening of the skin should be studiously avoided. If a reaction of the first degree or worse does occur following treatment, it invites the later development of telangiectases, although they may not make their appearance for from one to three years, perhaps even longer; in the majority of cases they do not occur at all. It is important not to use any other irritant drugs or measures which will inflame the skin and thus encourage an X-ray burn.

The author then gives the indications for and against X-ray therapy in ring worm, eczema, psoriasis, lichen, prurigo, leucoplakia, acne vulgaris, acne rosacea, lupus vulgaris, lupus erythematosus, warts, Paget's disease, mycosis fungoides, blastomycosis, port wine marks, naevus pigmentosus et pylosus, paronychia, keloid, luetic lesions, ulcers, hyperidrosis, superfluous hair, enlarged glands, epithelioma, sarcoma, carcinoma, prostatic hypertrophy, uterine fibroids, exophthalmic goiter, hyperthyroidism, anæmia, Hodgkins' disease, leukaemia, and thoracic disease. C. B. HOLLINGS.

**Fullerton, A.: The Use of the Opaque Ureteral Catheter to Localize Missiles in the Region of the Kidney and Ureter.** *Arch. Radiol. & Electrotherap.*, 1918, xxii, 371.

On account of the variable position of the kidney and differences in the thickness of the overlying tissues, it may be impossible to state definitely whether a missile in the kidney region is actually in that organ or merely near it, even though an accurate localization in different planes may have been made. The determination of this fact may have an important bearing on the treatment.

To ascertain it, the author has been using the opaque ureteral catheter *in situ* combined with stereoscopic roentgenography with excellent results. He cites a case in which he was able definitely to locate a bullet relative to the kidney and ureter before operation and confirmed his findings at the operation. A second case with three shell fragments in the renal region was similarly examined and the findings proven accurate by postmortem examination. ADOLPH HARTUNG.

**Shearer, J. S.: Localization of Foreign Bodies; the Standard Methods Approved by the Surgeon General's Office, U. S. Army.** *Am. J. Roentgenol.*, 1918, v, 229.

The methods selected have aimed to meet the following requirements: (1) The apparatus re-

quired should be simple. (2) The manipulation should not require an undue amount of skill. (3) The time required should be a minimum consistent with reasonable accuracy. (4) All operations likely to lead to error must be excluded. (5) The comfort of the patient should be considered.

In order to bring errors to a minimum incident to the reading of fine scales or any scale in bad light, to making arithmetical computations, drawing diagrams, or changing from bright light to read scales and back to fluoroscopic work, such accessory devices and organization of steps have been adopted as would tend to eliminate those contributing sources of error. To avoid confusions which might be caused by the varying descriptions in the literature, the methods adopted are referred to by letter rather than by the names of those responsible for their development. The object has been to obtain information of practical value in the removal of foreign bodies rather than refined mathematical accuracy.

The methods are divided into two groups. In the first, comprising methods A, B, and C, a mark is made upon the skin and the distance of the projectile from this mark is determined. In the second group, including methods D, E, and F, some material guide is given the surgeon to assist him during operation. The latter require more time as a rule and are better adapted for use in the base hospitals. It is assumed that the majority of the work will be done with the standard X-ray table by fluoroscopic methods and with the tube below the table.

Method A is the two-wire, double-tube shift method. The accessory devices needed with this are: (1) a substantial brass frame carrying two wires firmly attached across two opposite corners, protected by a thin sheet of aluminum, moving with the tube box; (2) a small celluloid scale with two sliders; and (3) a special scale giving the depth of the foreign body in centimeters and fractions thereof. The shadow of the projectile is first brought to the center of the fluoroscopic screen and perpendicularly below it and the skin marked at that point. The tube is then shifted until the shadow of one of the wires in the brass frame coincides with the displaced shadow of the projectile, and one of the sliders marks this position. Shifting the tube in the opposite direction until the other wire coincides with the shadow of the projectile determines the location of the second slider. The distance between the sliding markers is then utilized to determine the distance of the foreign body below the skin mark, the special scale giving the required depth.

Method B utilizes the optical principle of parallax. It consists essentially in adjusting an outside opaque body at such a depth alongside of the part containing the projectile that its shadow moves the same distance with a definite tube shift as does the shadow of the projectile with the same tube shift. A piece of celluloid ruled with parallel lines facilitates



the ascertaining of equality of motion. A special frame provided permits of the marking of the skin at the entrance and emergence of the vertical ray passing through the foreign body and also along a continuation of the rod carrying the special indicator. By using this with attached scales, the distance from the skin in three directions may be ascertained.

Method C makes use of arithmetic computations with the aid of the single tube shift and triangulation. The skin is first marked at the point of emergence of the vertical ray, this point coinciding with the center of the fluoroscopic screen. The tube is then shifted a known distance and the amount of displacement of the projectile shadow noted. With the aid of the known distances the depth may be ascertained by numerical computations. The process may be facilitated by working with constant factors or by use of an exact set-up device available.

Method D resorts to the drawing of diagrams by means of which the anatomic relations of the part in which the projectile is imbedded can be shown. A piece of hinged flexible metal is adjusted around the part and three lines of sight, each passing through the projectile, are indicated at their points of entrance and emergence by marks upon the skin and metal. The latter is then removed and a tracing made with it in its original position. By joining the points of the sight lines, the intersection shows the location of the projectile, and with the aid of a cross section anatomy definite anatomical information may be obtained as to the relative location of the surrounding structures.

Method E makes use of the Hirtz compass and accessory devices. To quote the author: "The essential feature of the Hirtz compass is the possibility of adjustment of the movable legs that support the instrument, so that when resing on fixed marks on the body of the patient the foreign body will be at the center of a sphere, a meridian arc of which is carried by the compass. This arc is capable of adjustment in any position about a central axis. An indicating rod passes through a slider attached to the movable arc in such a way as to coincide in

all positions with a radius of the sphere, and whether it actually reaches the center or not, it is always directed toward that point. If its movement to the center of the sphere is obstructed by the body of the patient, the amount it lacks of reaching the center will be the depth of the projectile in the direction indicated by the pointer.

"The value of the compass lies in its wide possibility as a surgical guide, in that it does not confine the attention of the surgeon to a single point marked on the skin, with a possible uncertainty as to the direction in which he should proceed in order to reach the projectile, but gives him a wide latitude of approach and explicit information as to depth in a direction of his own selection." The method is rather complicated and requires detailed study of apparatus, technique and accompanying diagrams.

Method F utilizes a cannula and trochar to approach the foreign body through the skin and tissue under fluoroscopic guidance. It is considered the least desirable of the methods adopted.

Regarding the assistance fluoroscopy may offer during operations, four methods have been proposed:

1. The X-ray work may be done in the surgical operating room, thus requiring the surgeon to operate in special light which may be extinguished when he desires to examine fluoroscopically.
2. The patient may be returned to the X-ray room when the surgeon requires further information.
3. The roentgenologist may be called to the operating room for temporary assistance in pointing out the position of the projectile.
4. The operation may be performed with special forceps while using the fluoroscopic light as a guide.

Each of these has its difficulties as well as merits, some of which are described by the author. Appended to this article is a table showing the depth of anatomical landmarks beneath the skin, taken from an article by Metcalf and Keys-Wells in the *Lancet* of May 27, 1916, and attention called to its value for the surgeon when operating for the removal of foreign bodies.

ADOLPH HARTUNG.

## MILITARY SURGERY

NOTE. — Readers are referred to the Table of Contents for other articles dealing with military surgery which appear under the various headings according to our anatomical arrangement.

**Charles, R.: Gunshot Wounds of the Abdomen at a Casualty Clearing Station.** *Brit. M. J.*, 1918, i, 337.

Diagnosis of intraperitoneal injury is often difficult. The signs and symptoms associated with these cases are not constant. The following points are important:

The entrance and exit wounds give an idea of the path of the missile. The absence of an exit wound does not necessarily mean that the missile is lodged in the viscera. The facial expression is usually that

of anxiety. Pain may or may not be present and may be referred. Tenderness elicited by deep pressure over the injured viscera is of great importance. Rigidity is an unreliable symptom. The pulse increases directly with the gravity of the lesion. Vomiting is usually present. X-ray is the most useful guide to diagnosis.

Treatment varies with the general condition of the patient, irrespective of the type of wound. Moribund patients are relieved as far as possible of pain and thirst. Those in various degrees of collapse

but capable of resuscitation are treated for shock. This consists in heat and saline subcutaneously with brandy, or in grave cases intravenous saline with 3 per cent bicarbonate. Operation should not be undertaken until the patient has recovered from shock. These cases as a rule have ceased to bleed and dangerous sepsis from perforation of the bowel does not occur for six hours. The patient must be kept warm, and saline is given during the operation. Speed is the first essential in avoiding further shock. The prognosis varies immensely with the length of operation.

A paramedian or transverse incision is made. Bleeding is first attended to. A systematic search is then made for the injury. Wounds of the intestine are covered with gauze, perforations clamped and left outside. The rest of the intestine as far as possible is returned at once into the peritoneal cavity. When both large and small bowels are perforated, the large one is usually sutured first. End-to-end anastomosis is the most rapid.

Wounds of the liver are often treated conservatively. Sometimes laparotomy is necessary and packing of the wound to control hæmorrhage after excision of the track, if accessible, or mechanical cleansing. In twenty-four to forty-eight hours, when the peritoneal cavity is walled off, gauze is removed and the Carrel-Dakin treatment instituted. Missiles in the pancreas were removed in two cases and drainage secured through the transverse mesocolon previously sutured to the anterior abdominal wall. The kidney is exposed by a transverse incision. Where possible, excision of only infected or damaged tissue with suture and drainage is recommended. Nephrectomy is done only for complete destruction of torn vessels.

The question of drainage is decided on the relative ineffectivity of the parts injured, and on the time elapsed since the wound was inflicted. Wounds of the small intestine operated upon within twelve hours may be closed with safety. Wounds of the large bowel are drained when possible.

Abdominothoracic wounds fall into four groups with respect to treatment:

1. Separate entrance wounds in the chest and abdomen. If the chest wound is not a blowing one, the abdomen is dealt with first; then if the patient's condition permits, the chest wound is attended to.

2. Entrance wound on the left about the sixth or eighth rib, with a high abdominal lesion. If the missile has gone through, conservative treatment is often sufficient. Where X-ray shows the missile in the lower abdomen, the case is treated as in the first group. Where the injury is limited to the upper abdomen, a transdiaphragmatic route is used because it saves time, access to the upper abdomen is easier, and a combined laparotomy and thoracotomy is avoided. The chest wound with all infected tissue is completely excised and enlarged backward and forward with the excision of five inches of affected rib. The pleura is opened, swabbed dry, and walled off with gauze. The rent in the dia-

phragm is enlarged to four or five inches. The abdominal condition is now treated, the diaphragm sutured, and injuries to the lung examined and treated as necessary. If impossible to close the parietal pleura and a large gap is left, it is closed by suturing the lung to the edge of the wound.

3. A wound of entrance on the left below the level of the eighth rib. In these cases the pleura often escapes injury. If present, it may be dealt with essentially as in the second group.

4. Wounds of the right side. The missile after penetrating the diaphragm is usually lodged in the liver. If operation is indicated, the pleural cavity is opened and probe and forceps are passed along the tract to locate and remove the missile. If the pleura is pierced near the attachment, the edges of the wound in the diaphragm are sutured to the parietal pleura, effecting complete closure of the pleura and drainage of the liver.

Of postoperative complications, shock is the most serious and is treated as already outlined. A 2 per cent solution of gum acacia may be substituted for sodium bicarbonate. Transfusion of blood is practiced where loss of blood has been severe. Dilatation of the stomach is treated by lavage. Paralytic ileus may be nervous in origin or due to peritonitis. The symptoms are the same. Little benefit has come from ileostomy. Several recovered, treated by frequent gastric lavage, intramuscular pituitrin, saline and enemas. Gas gangrene is often fatal. It is treated by wide excision of the affected muscle.

A few case histories are given. Of 150 cases, 23 of which were abdominothoracic, there were 74 deaths.

C. A. HEDBLÖM.

**Bowlby, A.: Primary Suture of Wounds at the Front in France.** *Brit. M. J.*, 1918, i, 333.

Soon after the beginning of the war surgeons were divided into two classes, those who counseled the use of strong antiseptics, and those who believed that no antiseptic treatment could possibly so antagonize the innumerable bacteria as to permit of early closure of the wounds. The first proved to be the counsel of false hopes; the second remained the counsel of despair as far as primary closure of wounds was concerned. It became evident that these wound conditions presented new problems which would have to be solved by careful and laborious investigations.

It soon became apparent that too much attention had been directed to the bacteria and disinfection and too little consideration had been given to the grossly contaminated devitalized or dead tissues. It was learned that not only the missile and foreign material carried in with it but also all damaged tissue required excision. Without such excision antiseptics were useless; with it antiseptics are merely accessories.

Systematic primary suture began with the knee-joint after it was discovered that many perforating wounds did well even though the synovial fluid



was infected, provided only that the joint was not opened and drained. Very cautiously primary suture was applied to fractures of the skull and wounds of the brain and abdomen.

In 1916 and 1917, when operations were attempted on the lung, it was found that success depended on immediate closure of the pleural cavity after the operation. Primary closure of wounds in the limbs where large vessels and nerves make thorough excision of devitalized tissue difficult was finally made possible with improvement in technique.

The rapid shift in the fundamental conception of the treatment of wounds is well indicated by the expressions of the Surgical Conference of the Allies. In May, 1917, it was agreed that operation may be followed in some instances by primary closure of the wound, notably in case of wounded joints, but in November of that year the conclusion arrived at was: "Since our last session, the disinfection of wounds has passed from the domain of the chemist to that of the surgeon. Primary suture has taken the place of secondary suture and has become the method of choice." These conclusions were based on the results of primary suture in all kinds of severe wounds in both French and British hospitals in the intervening six months. In one series of 433 cases, 98 per cent were severe shell or bomb injuries. In 67 per cent healing was by first intention and in a great many of the others they healed with only a little surface suppuration.

In another group of 626 cases, 68 per cent healed *per primam*. Of 100 fracture cases, 75 per cent healed *per primam* and 15 per cent of the remainder after slight suppuration. Of a total of 1,202 cases under various surgeons, successful primary suture was done in about 70 per cent.

In these series of cases no antiseptic had been used. The bacteriological studies in connection with treatment by various antiseptics has also demonstrated that healing by suture takes place in the majority of cases in the presence of bacteria. The hæmolytic streptococcus infection seems to be the isolated exception to the rule. The wound must, however, be free from dead tissue and foreign bodies. Generally speaking, the earlier the patient is operated upon, the better. Duval reports that 80 per cent of the "lightly wounded" without fracture have healed *per primam* when sutured eight to twelve hours after injury. When much oozing occurs at the time the wound is cleaned up, suture should be delayed twenty-four to forty-eight hours. In case of doubt as to whether or not a wound should be sutured, it is better to leave it open until the indication for treatment is clear. If the wound edges are indurated and inflamed or if gas gangrene has already definitely commenced, the wound must be left open.

Judgment in the selection of cases and skill and thoroughness in technique together with strict asepsis are essential to successful treatment. More surgeons are needed for this work.

C. A. HEDBLÖM.

**Brewer, I. W.:** *The Physical Condition of American Men of Military Age.* N. Y. M. J., 1918, cvii, 216.

Among 1,000 cases examined for the regular army, venereal disease was the greatest cause for rejection, heart disease standing second on the list. Defects of hearing and vision were third and fourth, flat feet fifth, defective teeth twelfth, tuberculosis fifteenth, and mental weakness sixteenth.

H. H. FREILICH.

## GYNECOLOGY

### UTERUS

**Heineberg, A.: Bloodless Repair of the Cervix Uteri.** *Am. J. Obst., N. Y.*, 1918, lxxvii, 652.

The technique of bloodless repair here described represents the results of several months' experimentation with various types of clamps, pins, and tourniquets. The author claims for it simplicity, ease of application, and efficiency. Hæmostasis is secured by the use of two angulated tenaculum forceps and a rubber ring such as is at times employed to secure the tops of umbrella ribs. The chief feature of the forceps, in addition to the angulation, is a pedunculated ball attached to the outer aspect of each blade just above the angle. These balls serve the purpose of retaining the rubber ring in a position to compress the cervix above the grasp of the forceps.

The technique is as follows:

1. Introduce a self-retaining speculum in the vagina.
2. Grasp the anterior lip of the cervix in the median line with an ordinary double tenaculum.
3. Dilate the cervix moderately, chiefly to determine the precise location and direction of the canal.
4. Draw the cervix toward one side and apply the angulated forceps to the cervix well above the level of the proposed amputation or denudation.
5. Draw the cervix to the other side and apply the second angulated forceps opposite the first one.
6. Remove the ordinary tenaculum.
7. Place the handles of the forceps together. Stretch the rubber ring over them and push it up on the cervix to above the retaining balls.
8. Separate the handles of the forceps and hand them to the assistant.

The forceps thus held act also as lateral retractors of the vagina. In order to prevent a ragged tear in the cervix, undue tension upon the forceps or unnecessary separation of the handles must be avoided. If it is desired to remove the forceps and ring before tying sutures, the ring may be cut. When the vagina is long and narrow or the cervix cannot be easily drawn down, a forceps with a long curve instead of an angle is more easily applied.

CAREY CULBERTSON.

**Bégouin, P.: A Method of Abdominal Hysterectomy for Fibroma with Lower Pole Impacted; Excavation Method** (*Procédé d'hystérectomie abdominale pour fibromes à pôle inférieur enclavé; "procédé de l'évidement"*). *Bull. et mém. Soc. de chir. de Par.*, 1918, xlv, 295.

Bégouin claims that the classical methods of abdominal hysterectomy for fibroma are not suitable to those cases in which the inferior pole is so im-

pacted and fixed in the lower pelvis that it cannot be raised up, and remains unapproachable on all sides. He recommends an operation which he terms the method of excavation.

With the left hand the surgeon seizes the superior pole of the fibroma and pulls it up with forceps; and after having clamped the uterine and utero-ovarian vessels on each side, makes a circular peripheric incision at the level of the lowest part of the fibroma which should be easily accessible. Starting from this circumference the bistoury describes successive wide and deep cones, the final apex of which is below the center of the pelvic fibromatous mass, just as one would dig out the tainted part of a pear with a knife. This section being completed, all the upper abdominal part of the fibroma is detached and removed, leaving only a fibromatous cupola in the lower pelvis. The whole of the central part of the primarily unapproachable pelvic mass is thus emptied, and a pull with forceps on the edges of the cupola will easily effect its separation from the surrounding organs.

The preliminary part of the process does not cause any important hæmorrhage if care be exerted to keep the knife within the fibromatous mass, well within its capsule. But in any case vessels which might bleed are quickly exposed and can be clamped. No injury can occur to the neighboring organs if the point of the knife in cutting the cone is kept directly toward the center of the pelvic mass.

Bégouin has used this procedure seven times since February last. He thinks that in the special case of fibroma with impacted lower pole it is superior to all other methods, such as enucleation, section, etc. It has undoubtedly been used by many other surgeons who were forced to adopt it by the exigencies of cases rendered too difficult for the usual methods; but so far as he knows it is not regularly described in the texts, and he thinks it of practical interest to direct attention to it.

The discussion showed that this or analogous methods had been often used by others in the conditions described by Bégouin. Both Pozzi and Quénu preferred enucleation. W. A. BRENNAN.

**Wobus, R. E.: The Acetone Treatment of Uterine Cancer.** *J. Missouri St. M. Ass.*, 1918, xv, 116.

Wobus briefly reviews the various treatments for uterine carcinoma and strongly endorses the acetone treatment, described by Gellhorn in 1907. It is valuable in inoperable cases, giving the patient comfort and a feeling of well-being.

The detail of technique is very important. A preliminary curettage should be done with a Boldt's cancer spoon in order to scoop out all the cancer masses. The rather profuse bleeding subsides



gradually as the normal firm tissue is reached and is effectively checked by the acetone.

The first treatment is given immediately after the excochleation. The patient is placed in the Trendelenburg position, a tubular glass speculum is introduced, and the cavity entirely filled with acetone. This should be repeated at least once, as the blood present dilutes the acetone. The fluid is removed with cotton swabs, the cavity loosely packed with gauze, which becomes saturated with the acetone, and the excess taken care of. This may be left in place until the following morning. A cotton tampon well saturated with vaseline is introduced and the speculum removed. Acetone does not irritate the vaginal mucosa, but affects the vulva, perineum, and anus when it comes in contact with them, and great care should be taken in protecting these tissues.

Subsequent treatments may be given at the office or the patient's home, commenced a few days after curettage and repeated every third to fifth day for as long as necessary. The patient's hips are elevated and the tubular speculum, coated with a thick ring of vaseline near the center, is used. The perineum is protected with cotton saturated with water. The acetone is poured through the speculum, which must be manipulated so that the fluid enters the crater and should be left for fifteen or twenty minutes. The rest of the treatment is the same as after the curettage. A cotton swab at the end of a uterine dressing forceps may aid in bringing obscure cavities into the axis of the speculum.

Two illustrations, one of materials used and the other a schematic drawing of a cavity filled with air and preventing the liquid from entering, accompany the article.

L. R. GOLDSMITH.

**McDonald, A.: Abdominal Uterine Hæmorrhage in Young Women.** *Arch. Diagnosis*, 1918, x, 361.

The cases as presented to the physician fall into one of two rather distinct groups: (1) those representing sudden deviation from a previously regular menstrual habit, possibly associated with amenorrhœa, and suggesting pathology of early pregnancy; (2) conditions of longer standing, menorrhagia or metrorrhagia, either of which may be important (a) as a symptom of serious lesion, new-growth, or (b) as a cause of constitutional changes, anæmia, etc.

Significant evidence to be noted includes: a period of amenorrhœa of from five to eight weeks, followed by atypical menstruation, sudden profuse flow with clots, irregular bleeding varying from scanty bloody discharge to profuse hæmorrhage, prolonged flow, unusual pain, especially unilateral, or the same conditions with no amenorrhœa. Such deviation, when sufficiently pronounced to bring the patient to her physician, is evidence of general or local pathological change and must be explained. Constitutional causes must be considered in some cases, but can usually be excluded by the history or examination.

Pathological activity of certain remote glands of internal secretion has a more or less direct influence on menstruation, but the resulting deviations are usually of longer duration. Menorrhagia is also observed in some forms of toxic exophthalmic goiter. A few cases of adrenal tumors or hypertrophy result in menorrhagia due either to internal secretion or pelvic hyperæmia. Pituitary lesions are most often associated with sexual dystrophy and amenorrhœa.

Sudden abnormal bleeding in young women following an amenorrhœa, however brief, is due to disturbance of early pregnancy till proven to the contrary.

In the absence of pregnancy, there are several lesions which give a clinical picture easily confused with ectopic gestation and characterized most prominently by atypical bleeding, unilateral pelvic pain and tenderness. These are: (1) mild exacerbation of chronic tubal infection or prolapse and torsion of a hydrosalpinx which causes pelvic pain and atypical bleeding, but no amenorrhœa; (2) ovarian cysts; (3) appendiceal inflammation, usually of the subacute type with adhesions to pelvic structures, which may cause atypical uterine bleeding without amenorrhœa; (4) small masses in the broad ligament.

Metrorrhagia is always of pathological significance, whether consisting simply of irregular bloody discharge or copious intermittent bleeding, especially when occurring at or near the menopause. The causes include: (1) abnormal uterine contents; (2) lesions associated with congestion or ulceration or endometrium.

Curettage, which is so often advised for these cases, should be done for diagnosis only, together with microscopic examination of curettings. Examination of curettings must be done by an expert since the microscopic picture of different stages of the menstrual cycle may be confusing, and a thorough curettage may miss a small area of cancer in the fundus. In certain cases where the diagnosis is still in doubt, exploratory hysterotomy is justified.

The importance of copious menstrual bleeding is measured not by the amount of blood lost, but by the effects on the patient.

It is easy to understand that normal functional activity of the uterus may be impaired by a number of conditions with no gross lesions of that organ. Such loss of physiological tone may be due to: (1) subinvolution, especially when resulting from rapidly repeated pregnancies; (2) chronic passive congestion with malposition; (3) inflammatory changes with infiltration of the myometrium; (4) premature or excessive senile fibrous degeneration and arteriosclerosis, especially when associated with increased ovarian stimulus.

Therapeutic measures include: (1) gland extracts and general treatment; (2) roentgen ray and radium; (3) exploratory laparotomy and hysterectomy.

EDWARD L. CORNELL.

## ADNEXAL AND PERIUTERINE CONDITIONS

**Grad, H.:** *Statistical Study of 100 Cases of Pyosalpinx.* *Am. J. Obst., N. Y.*, 1918, lxxvii, 630.

Only the surgical aspect of the cases are here considered, no attempt being made to group them according to clinical classification. In the acute cases it has become the custom of the author to employ non-surgical measures only, unless it be the evacuation vaginally of abscess formation. In the subacute and recurrent purulent types various operative procedures were undertaken.

In 62 of the 100 cases, both tubes were ablated; in 15, but one tube; in 18 the uterus, both tubes, and ovaries were removed. In 43 cases, one ovary was removed at the time of the operation for pyosalpinx, and both ovaries in 18 cases. The appendix was removed in 28 cases. In 8 per cent, one or more plastic operations were also performed, such as trachelorrhaphy and perineorrhaphy. Three times the round ligaments were shortened and twice a myomectomy was necessary. In only 5 per cent of the cases was vaginal section done when pyosalpingitis was diagnosed. In 26 per cent the uterus was curetted at the same time.

In 50 cases no drainage was deemed necessary. In 43 cases the pelvis was drained by the vagina, in 6 cases by the abdomen, and in 1 case by both routes. Of the 43 cases drained from below, the abdominal wound broke down in 6 cases, or 14 per cent. In the 6 cases of drainage above, the wound healed firmly in every case. Death occurred in one case thirty-six hours after operation from profound sepsis.

The majority of the cases remained in the hospital from twenty to thirty days, 12 cases for less than thirty-five days, 9 for less than forty days, 5 for less than fifty days, one for one hundred and three days. One case left in ten days.

CAREY CULBERTSON.

## MISCELLANEOUS

**Phillips, J.:** *The Therapeutic Influence of X-Rays on Female Pelvic Disease.* *Arch. Radiol. & Electrotherap.*, 1918, xxii, 333.

The treatment of female pelvic disease is the result of early experimentation in 1903, when the effect of the X-ray on testicles of rabbits was noted. A few years later its effect on the generative organs of the human female was definitely proved. Since that time abundant evidence has been collected to prove that X-rays are a most powerful remedial agent. Primarily the treatment was extensively tried in bleeding myomata of the uterus with very successful

results, and from that time until now, its field of usefulness has extended to other diseases. The author quotes Bruce and Knox with reference to their methods. Bruce gives in a case of myoma the maximum of X-ray radiation, depending on two factors, the skin and the X-ray tube. In the case of the skin the reaction must be kept at lowest terms. His remarks in reference to the X-ray tube seem to indicate that the Coolidge tube was not used, otherwise the dosage could be mathematically accurate.

Knox informs the author that the anterior abdominal wall from the level of the umbilicus to the margin of the pubic arch is divided into a number of "ports of entry" by means of a skin pencil, generally from four to eight on the anterior wall. Four areas are marked on the posterior surface of the pelvis to include the whole of the sacrum. The first series of doses is given just after the cessation of a period if possible. About ten areas are given either in one day or two consecutive days; the latter method is preferable. A second series is given as soon as possible after the next period. A cessation of menstruation marks the commencement of gradual improvement. To produce a satisfactory result, from three to six months are required. The longer method is preferable as it disturbs the patient least. The author reports the therapeutic value to be due to the action on the ovaries, the ovary being destroyed. In addition there is some influence on the muscular wall of the uterus itself.

He recommends the following classes of cases for X-ray treatment: (1) fibroids of the uterus, whether producing hæmorrhage or pain, or the subject of rapid growth; (2) myofibrosis or metritis; (3) carcinoma of the cervix, and as routine treatment before, during, and after complete extirpation of the uterus; (4) colitis; (5) for sterilization after cæsarean section in place of excision of the tubes; also in severe dysmenorrhœa and osteomalacia; (6) constitutional hæmorrhagic diseases; (7) to promote absorption in old standing chronic thickening; (8) certain skin diseases of the vulva, namely, pruritus, leucoplacia.

The author has noted the surgical end-results of his cases for thirty years and feels that some less drastic treatment might have been more successful, such as the intelligent use of the X-ray.

A discussion of the X-ray treatment in the type of cases enumerated above is given. The author concludes: "My own personal feeling is that in X-rays we have a very powerful remedy which, with increasing accuracy of diagnosis and administration, promises to be of inestimable value in the pathological female economy." C. B. HOLLINGS.



# OBSTETRICS

## PREGNANCY AND ITS COMPLICATIONS

**Acharya, S. R.: Abdominal Pregnancy.** *Madras M. J.*, 1918, i, 34.

A woman, aged thirty-eight years, was admitted to the Government Maternity Hospital. She complained of having a bloody vaginal discharge for two months and of an abdominal tumor which she noticed had been growing gradually for a year. She had had seven children, of which only two survived. She gave a history of an abortion eighteen months prior to the date of admission. Six months later she had amenorrhœa for ten months, then her present complaint began.

On opening the abdomen, a sac adherent to the anterior abdominal wall presented; on incising this a dark brown fluid escaped and a mummified foetus was found inside. On removal of the foetus and its placenta, another sac was seen adherent to the posterior aspect of the first sac. It contained a similar foetus and placenta, which were removed. The uterus was not enlarged.

The wound healed by first intention and the patient was discharged from the hospital three weeks later.

EDWARD L. CORNELL.

**Polak, J. O.: Diagnosis of Unruptured Ectopic Pregnancy.** *Long Island M. J.*, 1918, xii, 121.

Polak states that a positive diagnosis of unruptured ectopic pregnancy or tubal abortion should be made in the vast majority of cases. In his service at the Long Island College Hospital, and in over 250 personal cases, a positive diagnosis was made in over 85 per cent of the cases. This he believes was attributable to the fact that a very careful history was taken and a thorough physical examination made in each instance. The conditions, pathological or mechanical, that may cause a delay in the progress of the impregnated ovum are always indicated in the history if the attending physician or surgeon takes the trouble to correlate the facts as stated by the patient.

Naturally the diagnosis of ruptured ectopic with the consequent hæmorrhage and shock is very much easier to diagnose.

The causes of ectopic gestation are fully discussed, particularly from the standpoint of the pathology of the various conditions that have to do with extra-uterine pregnancy. These in turn are linked with the past history, so that, by the proper interpretation of the pathology present, by the history that is always obtainable, the diagnosis at once becomes easier and more exact.

There are several very excellent drawings by Shannon that serve well to help elucidate the pathology of extra-uterine pregnancy.

The treatment, Polak believes, of the unruptured ectopic is operative as soon as the diagnosis has been made. After rupture has taken place, i.e., in the tragic stage, operation should be postponed until the patient has recovered from the shock incident to the hæmorrhage following rupture. Almost all of these patients will "come back" with rest and morphine. They are given an initial dose of half a grain of morphine, followed by one-fourth of a grain every three hours until the respirations are reduced to from eight to twelve per minute. The author further states that he has yet to see a case which has not reacted and become a safe operable risk under this treatment.

The operation is always done by the abdominal route and the tube either emptied of its contents or amputated. In the removal of the tube great care should be exercised in individually ligating the vessels in the mesosalpinx so that the collateral circulation to the ovary is not interfered with. "After the tube is removed, the ovary is suspended by suture of the infundibulopelvic ligament to the round ligament and the raw surface at the top of the broad ligament peritonealized by whipping the mesosalpinx and round ligament together."

HARVEY B. MATTHEWS.

**Gardner, W. S.: The Cause of Tubal Pregnancy.** *W. Virg. M. J.*, 1918, xii, 370.

Twenty pregnant tubes that had sufficiently long undilated portions remaining between the pregnancy and the uterus to make a block have been examined microscopically. In eight instances sections from the opposite tube also were made.

All but one of the tubes showed results of a past infection. The one in which there was no such evidence was associated with a large uterine fibroid and the pregnant tube was found crowded down in the pelvis under the tumor. In all of the others were found the same changes as are found subsequent to salpingitis.

The sections of all the tubes showed the same enlargement of all the cells making up the walls and the round cell infiltration that is present in the uterine wall during pregnancy. The only difference was that the reaction of the normal cells and the round cell infiltration was apparently greater in the wall of the pregnant tube than in the wall of the pregnant uterus. In one or two sections the round cell infiltration was so intense as to indicate the presence of an active inflammatory process.

Among the eight tubes examined from patients in whom a pregnancy was present in the opposite tube, one was found that was normal, showing only the cell changes that result from pregnancy. This tube was from a patient having a fibroid. Two

tubes were much distended; one was filled with blood and one with pus. Four showed many adhesions between the folds of the mucosa splitting the lumen of the tube up into numerous channels of various sizes. Four showed great increase in the connective tissue in the remaining folds. Two had the blood-vessels of the wall markedly dilated and filled with blood. All of them showed round cell infiltration in the walls of the tube.

EDWARD L. CORNELL.

**Edgar, J. C.: The Treatment of Eclampsia.** *J. Am. M. Ass.*, 1918, lxx, 1205.

For years it has been realized that thousands of pregnant women are practically unobserved until at or near their date of confinement. A long step forward in the prevention of eclampsia is the attention that in the past few years has been directed to the importance of prenatal care of women.

One outcome of this agitation is the recent organization of the Maternity Service Association of the City of New York. One aim, among others, of the nurses of a maternity center is to seek out among the women of the tenements those showing signs of pregnancy toxæmia and refer such women to the proper clinic or hospital of the sanitary zone in which they reside.

During January, 1918, twenty patients suffering from various prenatal and postpartum conditions were referred by the nurses of the maternity center to the Manhattan Maternity. Nine of these women received into the hospital were instances of pregnancy toxæmia. Five were primiparæ, four multiparæ. The blood-pressure ranged from normal to 228 mm. All had albumin in the urine, four had casts, and one had blood. Gastric disturbances were present in all, and œdema in most. Eleven convulsions occurred in one woman, and two in another after admission; seven had labor induced by Champetier de Ribes bags; the two convulsive cases went into labor spontaneously. In only one instance were forceps used. In one twin case version and breech extraction were demanded. In a fœtus dead from prolapse of the cord, perforation and extraction were performed. All the nine mothers are alive today.

Of the ten children, there being a twin case, one was lost from prolapse of the cord, one was still-born at term, probably from toxæmia, and one, a three-pound macerated fœtus, was delivered. This patient had experienced seven previous stillbirths. She had a negative Wassermann reaction.

The time-honored principles of the curative treatment of toxæmic convulsions, namely, (1) control of the convulsions; (2) elimination of the toxins; and (3) termination of the pregnancy, still hold good, although recent clinical experience has somewhat modified them.

A one-time advocate of active surgical and medical treatment and bitterly opposed to morphine in eclampsia, experience of the past five years has radically changed the author's views and teaching.

Like many another obstetrician, he frankly confesses to have been won over to the use of morphine. He stands for a reasonably conservative treatment, neither an ultraradical, with its incisions of the cervix, accouchement forcé, difficult forceps or version, vaginal or abdominal cæsarean operations on the one hand, nor an ultraconservative treatment with its main reliance on morphine and eliminations, on the other. So long as eclampsia is a mystery, a disease of theories, no one treatment is applicable to all cases.

Difficult forceps operation, forcible dilatation of the cervix, incisions of the cervix, and vaginal cæsarean section have no place in the modern treatment of eclampsia at term. A single low forceps operation is always in order. Ether is the only anæsthetic to be used for any operation.

The same may be said of hydrostatic bags to induce or shorten the labor, as well as the manual dilatation of a soft, already partially dilated cervix, to permit of a medium or low forceps operation. In the presence of a disease with such a high fœtal mortality from any treatment, perforation of the head and a careful extraction of the body should be justified to shorten the interval between the first convulsion and delivery in certain instances.

Until more is known of the causative factors in eclampsia, abdominal cæsarean section will always demand a place in the treatment. The indications for the operation are still limited by reason of the remarkable results that have been obtained from the morphine treatment.

Abdominal cæsarean section must be considered in a primipara with a long, undilated cervix, to anticipate the twenty hours of spontaneous labor that she would otherwise pass through. A twenty-minute abdominal cæsarean section, in the present knowledge of eclampsia, would appear preferable to the shock of a difficult version and extraction in a shoulder presentation, or the shock of a prolonged labor in moderately obstructed labor, whether of pelvic or of fœtal origin.

A review of the present and prospective obstetric situation causes a recurrence of the reflection that the very poor and the well-to-do are today receiving the best obstetric care, while those of the so-called middle class are the ones who, all too often, suffer from indifferent prenatal attention.

EDWARD L. CORNELL.

**Manueco: Comparison Between Pubiotomy and the Cæsarean Operation in Moderate Pelvic Strictures** (Juicio comparativo acerca de la pubiotomía y cesarea en las estrechas moderadas de la pelvis). *Arch. de ginec., obst. y pediat.*, Barcelona, 1918, xxxi, 39.

Since January 1, 1910, among 805 labors, the author has observed 26 cases of contracted pelvis. These have been from 8 to 9.5 cm. No patient has been seen with a true conjugate diameter less than 8 cm. Of these 26 cases, 14 had a spontaneous birth; 12 had operative intervention. The interventions



and results were as follows: pubiotomy, 2 cases; prophylactic version, 2 cases; version for trunk presentation, 1 case; forceps in cavity, 7 cases.

The author considers a moderately contracted pelvis one comprised in the first and second grades of Baisch's classification, viz., from 7 to 8 cm. and from 8 to 10 cm. of true conjugate diameter.

The cæsarean operation obtained great popularity after the introduction of Franke's suprapubic method.

A comparison between pubiotomy and the cæsarean operation cannot be made *a priori*. One operation does not exclude the other and each has its own indications. It is to a great extent a matter of one's point of view, according as greater importance is attached to the danger for the mother or for the child. The chief objections to pubiotomy made by its opponents are: (1) that while its mortality is less than that of the cæsarean, yet this is obtained at the expense of danger to the mother; long convalescence, vaginal and uterine prolapse, hernia at the site of the osseous section and urinary incontinence. Manueco shows that these objections are more apparent than real.

As regards the cæsarean operation, it is the safest way to obtain a living child but the prognosis is more dangerous for the mother than in pubiotomy. The low mortality obtained by Schauta and others is exceptional and this may be reported as about 7 per cent. Subsequent uterine rupture, adhesions, the greater difficulties of technique, and the danger of infection render the operation more dangerous than pubiotomy. Even the most acceptable technique, the Latzko-Doederlein, is not extraperitoneal and the danger of infection is greater. The claim that this method is the most applicable in infected cases does not seem sustained to the author, judging from the unfavorable reports in this class of cases by Bumm, Doederlein, and others.

The author thinks that pubiotomy ought to be the method of choice in cases of moderately contracted pelvis; and that only exceptionally in cases of an extremely contracted pelvis and a large foetus should the cæsarean operation be carried out.

W. A. BRENNAN.

**Morse, A. H.: Premature Separation of the Normally Implanted Placenta.** *Surg., Gynec. & Obst.*, 1918, xxvi, 133.

Among the causes of antepartum hæmorrhage at full term, or nearly so, premature separation of the placenta occupies a place scarcely second in importance to placenta prævia, for it is no less frequent than placenta prævia and may require equally radical treatment. Occasionally, after the uterus has been emptied of the foetus and placenta, the mother collapses and dies in shock without further loss of blood.

In these cases the uterus presents a remarkable picture; its color is bluish black from the extravasation of blood into its substance, and it resembles somewhat an ovarian cyst with twisted pedicle.

Following delivery the uterus does not retract, but remains flaccid, and hysterectomy is necessary to control hæmorrhage. This abnormal reaction, as histological study demonstrates, depends upon the disorganization of the myometrium which is infiltrated with blood and lymph.

Two cases of this type were recently treated by abdominal cæsarean section and supravaginal hysterectomy. As there was no clinical evidence to indicate the cause of the intramuscular lesion, a series of experiments was performed and a technique developed which reproduced in animals the lesions which have been described in women suffering from the more serious type of premature separation of the placenta.

The clinical and pathological notes upon the two patients are given in detail. EDWARD L. CORNELL.

**Berri, I. C.: An Interesting Breus Mole** (Sobra una interesante mola de Breus). *Semana méd.*, Buenos Aires, 1918, xxv, 103.

The author relates a case of uterine mole in a woman aged 40 years, with a history of nine previous pregnancies, six ending normally at term and three aborted. The woman gave a four plus Wassermann reaction. In the present illness there was amenorrhœa for six months and metrorrhagia since the fourth month of pregnancy, which had now reached the seventh month. The woman aborted on coming to the hospital; the discharged ovum corresponded in size and aspect to that of a three months' pregnancy.

Detailed examination failed to discover a foetus or any vestiges of one; it had perished in the early months and was resorbed. The piece had all the characteristics corresponding to the tuberous hæmatoma described by Breus. The placenta was retained a long time in the uterine cavity and showed structural alterations due to autolytic processes.

The author reviews the findings of Breus, Gottschalk, Taussig and others regarding moles and the mode of death of the embryo with subsequent evolution.

The author thinks that there is some specific connection between syphilis and the development in his own case.

W. A. BRENNAN.

**Smith, F. H.: Urinary Infections of Pregnancy and the Puerperium.** *Am. J. M. Sc.*, 1918, clv, 392.

The diagnosis of these infections of pregnancy depends in large measure upon whether they are considered as among the possibilities of the illness. The main symptom in the greatest number is the toxæmia. Toxæmia, with high fever, chills, leucocytosis and pus in an acid urine, with the presence of the colon bacillus in pure culture, should of course suggest the diagnosis. When pain is the prominent symptom, the confusion that arises will depend upon how exactly it imitates some other pain. For instance, pleurisy may be suggested. The inflamed kidney moves painfully with breathing,

suggesting at once a respiratory disease. Pressure on the inflamed right ureter will often produce pain in the ileocaecal region similar to that of appendicitis. It is peculiarly liable to be confused with appendicitis in those cases in which there is no change in the urine for the time being, or if the urinary changes are slight and transient, or if the ureter is blocked so that only urine from the sound kidney is obtained by the catheter. Pyelitis may induce symptoms suggesting peritonitis. Pyelitis may also simulate salpingitis or puerperal infection.

Practically, however, the greatest difficulty in the differential diagnosis is to distinguish these cases from acute appendicitis. Chills, septic oscillations in the temperature, and pain are more violent in a renal case than in an early appendicular one.

Direct local treatment of the suppurative focus in the pelvis of the kidney and surrounding tissues through the cystoscope and ureteral catheter is the method of choice. There is one rather mechanical mode of treatment that is probably not so often used as it deserves, namely, the distention of the bladder to its physiological capacity, the patient reclining with only the head above the plane of the bed. This reduces congestion in the renal pelvis, stimulates kidney secretion, modifies the urine, and thus combats the cause of retention and helps in the evacuation of the kidneys.

The author's experience is that urotropin has rarely been of service in the upper urinary infections, perhaps because of the impracticability of getting the urine acid enough to split off formaldehyde during the rapid transit through the kidneys and ureters. When the infecting agent is the colon bacillus, the one method of treatment which has given most satisfaction is alkalization of the urine by potassium citrate. The plan is to give potassium citrate in sufficient dosage and with sufficient frequency to render the urine alkaline and to keep it so, day and night, for at least a week or ten days after all symptoms have disappeared.

Treatment which has been efficacious and at the same time practicable is: (1) Rapid alkalization of the urine with potassium citrate. This has been more certain by far than hexamethylenamin. Certainly, potassium citrate and hexamethylenamin should not be given at the same time, for one tends to render the urine alkaline and the other depends upon a high degree of acidity for any possible value. (2) In the meantime one can usually get a supply of the "sensitized" vaccine of the colon bacillus, because it can be sooner given than (3) an autogenous vaccine, which should be prepared as soon as possible. Under such treatment all cases should be controlled until delivery, but should the symptoms persist stormily in spite of this, then the patient should have irrigation of the kidney pelvis or possibly even nephrotomy or nephrectomy.

Mere persistence of pyuria, on the other hand, is to be expected and need occasion no undue alarm, if the patient be symptomless, and especially if there is no fever and no leucocytosis. Such pa-

tients usually go to full term with normal labor and puerperium, immune apparently from risks of their infection.

EDWARD L. CORNELL.

#### LABOR AND ITS COMPLICATIONS

**Palmer, C. B.:** *Obstetrical Anæsthesia. Calif. St. J. Med.*, 1918, xvi, 175.

For the past few months in the Division of Obstetrics and Gynecology of the Stanford University Medical School, nitrous oxide-oxygen has been administered to all patients in labor who could pay a given sum for the gas and for those who, for any reason, presented contra-indications to the use of ether, whether they could pay for the gas or not.

Nitrous oxide-oxygen certainly does not delay labor in the second stage and may be given in such a way as to shorten the duration of this stage. When forceps are indicated, continuous nitrous oxide-oxygen analgesia or a moderate degree of anæsthesia is eminently satisfactory, with possibly the addition of a very small amount of ether at the perineal stage to secure relaxation.

The addition of a small quantity of ether, without any diminution or even a slight increase in the percentage of oxygen, is a relatively harmless procedure, while the attempt to secure relaxation by decreasing the amount of oxygen beyond certain limits is always dangerous and especially so in obstetrics.

When version or any other procedure requiring relaxation is indicated, nitrous oxide-oxygen-ether or ether-oxygen is unquestionably the safest for the fœtus and probably for the mother as well.

The effect of this anæsthesia on postpartum hæmorrhage, lacerations, and cæsarean section is discussed.

The school is able to give gas for obstetrical cases at a cost of \$2.50 to each patient.

In the series of cases since they commenced giving gas to all obstetrical patients who so desired, there are 201, of which number 83 had nitrous oxide-oxygen followed by ether; 81 had ether and 18 had no anæsthetic. These last were mainly patients who entered the hospital a few minutes before delivery. Their records are complete in all respects except for some gaps in the duration of the various stages.

EDWARD L. CORNELL.

#### PUERPERIUM AND ITS COMPLICATIONS

**Infantozzi, J.:** *Treatment of Puerperal Endometritis by Permanent Drainage* (Tratamiento de la endometritis puerperal por el drenaje a permanencia). *Rev. argent. de obst. y ginec.*, 1918, ii, 59.

For some years in the obstetrical clinic of the Faculty of Medicine in Montevideo it has been the custom to treat puerperal infection localized in the endometrium by placing a permanent glass drainage tube followed by intra-uterine instillation of antiseptic fluid. The method has undergone various modifications.



The author is of the opinion that large, repeated, and continuous intra-uterine irrigations are dangerous and should not be systematically employed. Instrumental curettage of the infected uterine mucosa has disastrous effects and ought never to be practised since it always destroys the granular barrier of the endometrium. When there are remnants in the infected uterine cavity, curettage, either digital or with a blunt spoon, may prudently be done, which respects the uterine wall. If this is neglected, the infection may spread and become generalized.

Rubber tubes are not generally satisfactory for draining the uterus, since they become clogged easily; if they must be used they should be of large caliber. The Mouchotte tube does not drain the uterus well and at times produces gangrene of the cervical mucosa. It obstructs rather than drains. Glass tubes have none of these disadvantages and keep the uterus perfectly permeable. Those employed by the author are specially made of different shapes and with numerous perforations.

Intra-uterine instillations of 5 per cent glycerol or creosote-turpentine or of the Carrel fluid have none of the disadvantages of the large intra-uterine irrigations commonly practised.

The only serious drawback in the placing of the drainage tube is the possible inoculation of the healthy endometrium by streptococci, gonococci, etc., existing in the external genital passages.

This however can easily be avoided by careful examination and by not placing the tube unless the uterine mucosa is infected, making a previous careful disinfection of the vulva, vagina, and uterine neck.

For the past two years out of 1,870 maternity cases 249 were treated for infection. Of these 81 were infected abortion cases.

There were 27 deaths. The author is satisfied that by early application of his method spread of the infection which threatened the life of the patient has been avoided.

W. A. BRENNAN.

**Watson, B. P., and Scott, W. A.: Analysis of Clinical Types of Puerperal Fever, with Special Reference to Prognosis and Treatment.** *Canad. M. Ass. J.*, 1918, viii, 321.

The authors have made an analysis of the clinical types of puerperal fever occurring in the obstetrical department of the Toronto General Hospital and those cases already infected that were sent into the gynecological service for the two years ending

December 31, 1916. From the obstetrical service there were 2,096 cases. Of these 476, or 22.9 per cent, showed morbidity. There were 97 cases from the gynecological service.

From this study they draw the following conclusions:

1. In 85 per cent of cases developing fever in the puerperium, the fever quickly subsides without any definite pathological lesion developing.

2. When a definite pathological lesion does develop, it does not manifest itself for some time after the first rise of temperature.

3. When a definite pathological lesion is present in the pelvis, the infection starts as a wound infection of some part of the genital tract.

4. The primary infection may remain localized for varying lengths of time, or it may spread by: (a) continuity; (b) the blood-stream; (c) the lymphatics.

5. The lesions arising from the spread of infection by continuity of the tissues are usually either pus tubes, pelvic peritonitis, or a general peritonitis. The most common causative organisms are the gonococcus and streptococcus. Lesions due to the gonococcus appear late in the puerperium, whereas those from the streptococcus appear early and the prognosis is not so good.

6. Infections spreading by the blood-stream are usually of the thrombophlebitic type, which ordinarily begins in the thrombosed veins of the placental site, but may occasionally arise from a primary infection in the perineum or vagina.

7. Infections which spread by the lymphatics in most instances give rise either to a cellulitis or to a septicæmia. This is the most serious type of puerperal infection and usually causes death.

8. The type of organism is not of so much importance as the situation in which that organism is growing, i. e., as the anatomical lesion.

9. There is at present no means of treating primary infection in the uterus which does not at the same time favor extension of the inflammatory process to the surrounding tissues or the blood-stream.

10. All cases should, therefore, be treated expectantly during the early stages.

11. When a definite pelvic lesion does develop, it should be dealt with along the lines of established procedures.

12. The pathological process of puerperal fever is the same whether the sepsis follows labor or abortion.

HARVEY B. MATTHEWS.

## GENITO-URINARY SURGERY

### KIDNEY AND URETER

**Black, K.:** Case of Calculous Pyonephrosis. *Indian M. Gaz.*, 1918, liii, 60.

Black reports a patient aged forty-two who was admitted to the Gerard Freeman Thomas War Hospital, Bombay, with a discharging sinus in the right loin. Trouble began with debility and weakness one year previous. There was no colic or pain in the loin; this had developed insidiously. An abscess was opened and drained, leaving a persisting sinus in the right loin. The patient had some fever. No trace of urine came from the sinus, as was determined by administering methylene blue by mouth. X-ray examinations were negative for the left kidney, but on the right side a dark shadow was evident suggesting a calculus.

As a urethral stricture was present, internal urethrotomy was done followed by cystoscopy. The bladder interior was seen to be trabeculated; there was no cystitis. Pus was seen coming from the right ureter; clear urine came from the left. The ureters were catheterized; pure pus was obtained from the right kidney and normal urine from the left kidney.

Assisted by Macqueen, Black did a right kidney removal through incision in the right loin. The kidney was found very much enlarged and adherent to the surrounding tissues, which were exceedingly fatty and fibrous. On opening the kidney it was found to be a loculated shell full of pus, containing several small calculi in the lower part of the pelvis. The patient made a rapid recovery, and was discharged apparently completely cured five weeks after operation.

A colored plate illustrating the pathology of the kidney accompanies the article.

H. W. E. WALTHER.

**Culver, H., Herrold, R. D., and Phifer, F. M.:** Renal Infections; a Clinical and Bacteriologic Study. *J. Am. M. Ass.*, 1918, lxx, 1444.

A report is made of a study of 116 instances of non-surgical, non-tuberculous renal infections, of which 31 per cent were in males and 69 per cent in females. But 12 of these patients had other abnormalities of the urinary tract, while 36 had demonstrable lesions outside the urinary tract, leaving 58 per cent with no abnormal conditions other than the renal infection.

Bilateral infections were found in 58 per cent and unilateral infections in 42 per cent of the patients. Of the unilateral infections the right side had 52 per cent, against 48 per cent for the left.

The symptoms were found to be variable; but three symptoms were much more common than the others and may be considered the cardinal symptoms

of renal infections: chills and fever, present in 49 per cent, pain in the back in 45 per cent, and frequent painful urination in 40 per cent of all patients.

Cystoscopically normal bladders were found in 32 per cent of the patients, while the others presented varying degrees of hyperæmia and oedema depending upon the degree of vesical inflammatory reaction.

Bacteriological studies revealed the colon bacillus in pure culture in 74 per cent of the cases, while it was found in 85 per cent either in one or mixed culture; the staphylococcus was found in pure culture in 8 per cent and altogether in 16 per cent of the patients. Organisms occasionally found were streptococci, typhoid bacilli, pyocyaneus, diphtheroids and leptothrix, but in general it may be said that renal infection is caused either by the colon bacillus or the staphylococcus.

These infections were wrongly diagnosed in many instances. Such diagnosis as renal calculus, pneumonia, typhoid fever, salpingitis, appendicitis and sciatica being among the most common mistaken diagnoses.

The treatment consisted of internal administration of hexamethylenamine alternating with alkalis, and where possible, local treatment by pelvic irrigation was carried out. Only those cases were considered cured that presented sterile catheterized ureteral urine on two successive examinations one week apart.

Cases are cited to emphasize that disappearance of symptoms is not synonymous with cure, as such patients are prone to return with exacerbations, while those bacteriologically cured have had no recurrence.

The authors find that the irrigation treatment is more efficacious in colon bacillus than in staphylococcus infections, which is in accord with the histopathologic differences in these two types of infection.

HARRY CULVER.

**Martin, S. P.:** Hydronephrosis as an Underlying Cause in Attacks of Acute Abdominal Pain. *N. Y. M. J.*, 1918, cvii, 834.

The author demonstrates the possibility of a hydronephrosis as the underlying cause in all doubtful cases of attacks of acute abdominal pain.

The renal pelvis as well as its ureter may become dilated at any period of life and in either sex as the result of the following conditions: (1) mechanical obstruction; (2) infections; and (3) tumor.

As the result of constant mechanical obstruction to the ureter, that portion of the ureter above the obstruction and the renal pelvis will become dilated, the dilatation varying in amount according to the duration and extent of the obstruction. The dila-



tation is also accompanied subjectively by pain. The pain varies in intensity from a slight dull ache to severe, sharp, knife-like attacks radiating from the loin or epigastrium on the affected side down across the lower abdomen into the genitalia, often so severe that opiates are required before relief is obtained. The patient may be told, especially if the pain has been on the right side, that he has appendicitis. An appendicectomy may then be performed and, the attacks of pain still persisting, the patient is frequently subjected to a second operation for the removal of the gall-bladder, or if the patient is a woman, often an ovary. Still no relief is obtained and the patient then goes from one physician to another, being treated for neurosis, lumbago, ptosis, indigestion, and so forth, while the real underlying cause of the trouble is entirely overlooked.

This is the type of case that should have a complete urological examination to determine the possible existence of a hydronephrosis. As a rule, with hydronephrosis of moderate degree the demonstration of more or less obstruction to the ureteral catheter in the upper ureter and following this the existence of residual urine beyond the obstruction which is characterized by its rapid flow will suffice to call attention to the probable existence of a hydronephrosis. Should any doubt arise, however, the condition can be further demonstrated by means of the over-distention method. Thus if an ounce or more of sterile solution can be injected into the renal pelvis without any evidence of return flow around the catheter before pain is caused, it is safe to say that hydronephrosis is present.

The pathological changes that take place in a hydronephrosis may be summed up as follows: At first only the ureter, pelvis, and calyces are dilated, but sooner or later, if the condition persists, the kidney substance is thinned out and stretched over the distended calyces until the parenchyma has almost disappeared and the kidney is represented only by a mere shell surrounding a loculi of fluid. The surface often appears lobulated, resembling a foetal kidney.

The histological changes that take place depending on the duration of the obstruction are as follows:

1. There is a dilatation of the tubules with flattening and atrophy of the lining cells, many of which are shed.
2. The cells of the interstitial tissue have multiplied and produced a fibrocellular network filled with round cells around the tubules. Interstitial hæmorrhages will be seen when the blood-vessels have been pressed upon.
3. The tubules have undergone atrophy and may have disappeared, their places being taken by fibrous tissue.
4. Bowman's capsules are at first distended with fluid and the glomeruli are pushed aside, but finally they are replaced by fibrous tissue and disappear.

The outline of the normal renal pelvis may

assume a great variety of sizes and shapes, depending to some extent on the degree of distention by the injected medium. Unless the pelvis is fully distended, its exact outline cannot be accurately ascertained. Incomplete distention may give an erroneous impression of the outline and may lead to error in interpretation.

The author demonstrates on plates the normal renal pelvis and different types of hydronephrosis.

THEO. DROZDOWITZ.

**Bugbee, H. G.: The Management of Renal Tuberculosis.** *Surg., Gynec. & Obst.*, 1918, xxvi, 479.

This article dealing with the pathology, diagnosis and treatment of renal tuberculosis is based upon the study of five cases reported in detail.

The author quotes freely from the literature on the subject and summarizes the present status of renal tuberculosis as follows:

1. Renal tuberculosis may be a primary lesion and arise from a filtration of tubercle bacilli from the blood stream into the parenchyma or tubules of the kidney, where tissue changes similar to those found in tuberculous foci in other parts of the body take place.
2. An effort is always made to wall off the process, but the formation of antibodies is so slow, and the immunity of the patient, which may always have been absent or which may have been temporarily diminished, is so low that the lesion usually gets beyond control, and usually goes on to wide destruction of the kidney and extension to the other kidney, to other parts of the urinary tract and of the body.
3. From the nature of the lesion, remissions are common.
4. The symptoms of renal tuberculosis are misleading, often slight at onset, and give no indication of the extent of the lesion.
5. The diagnosis of renal tuberculosis may be simple or may be the most difficult of all urinary lesions, often requiring preliminary treatment to allay acute symptoms and repeated cystoscopic examinations over a long period of time.
6. The treatment cannot be outlined from a study of symptoms. The remissions of symptoms often for long periods of time should not be accepted as a cure.
7. The effort on the part of nature to inhibit the progress of the disease and to limit the lesion should be borne in mind, utilized and encouraged in every possible manner in inoperable cases, as well as before and after operation.
8. While many others have had cases similar to two of the author's, where the active tuberculous process has been arrested and walled off, still this is not the rule, the lesion being progressive. Even when arrested, a kidney which is the site of poorly drained cavities is a menace to the system. Therefore nephrectomy is the proper treatment.
9. With the means at hand by which one can often make an early and accurate diagnosis of renal

tuberculosis and with statistics showing that 75 per cent of the cases of infections are cured by nephrectomy, the tendency is to be too optimistic as to the future of these cases.

They should all report regularly, be watched and treated as cases of general tuberculosis.

H. G. HAMER.

**Moore, C. U.: Renal Function Test in Children.**

*Northwest Med.*, 1918, xvii, 78.

As to how many and what tests are essential to an accurate understanding of the severity of a kidney lesion or lesions, there is some difference of opinion, yet most laboratory men agree that the more tests that can be made in a given case the better. Moore makes mention of the uric acid of the blood determination, urea nitrogen of blood and urine, Ambard's coefficient, creatinin, alkali reserve of the plasma, and sugar of the blood.

Short biochemic tests are now available, by means of which degrees of renal impairment may be determined. Moore reviews the ones clinically applicable. Where blood can be obtained he states that the estimation of its urea nitrogen gives data of immense importance in diagnosis, prognosis, and treatment. Where the blood cannot be obtained, the phenolsulphonephthalein test can usually be applied.

Acidosis can be diagnosed early and its degree measured by determining the alkali reserve of the plasma. The alveolar carbon dioxide tension stands next in importance. Acetonuria may or may not accompany acidosis.

In selected cases the test meal for renal function gives valuable therapeutic data.

Moore presents two cases which illustrate the value of a thorough laboratory investigation of the acute nephritides in children. H. W. E. WALTHER.

**Tenney, B.: Renal and Ureteral Stone.** *Boston M. & S. J.*, 1918, clxxviii, 731.

The relative frequency of urinary stone is indicated by the fact that the diagnosis of stone in the urinary tract was made in one per cent of the total surgical admissions to the two largest Boston hospitals in a five-year period.

The origin of these stones is not yet fully understood but may be a combination of bacterial action and mechanical obstruction in some portion of the kidney.

Crystalline deposits in the kidney substance may be produced experimentally and are not rare in the human kidney. Symptoms appear when their migration is stopped by some irregularity of a kidney calyx, a narrow spot in the ureter, obstruction at the bladder outlet, or in the urethra.

Urinary obstruction is more common than any one cause, but the subjective symptoms are much the same, whatever the cause. A stone which is not obstructing the flow of urine may produce such mild and indefinite symptoms that its discovery by

X-ray or in the course of some abdominal operation may be unexpected.

The characteristic symptoms of renal and ureteral stone are hæmaturia, subcostal or vesical pain, and frequent urination. This combination never exists without some serious lesion in the urinary tract, though the lesion may not be an obstructing stone. On the other hand, a stone may lie in the kidney, ureter, or bladder for long periods without producing any of these symptoms.

The X-ray gives valuable assistance in diagnosis but cannot be trusted implicitly. The cystoscope and ureteral catheter sometimes give a positive diagnosis but more often contribute their share of the evidence. With these aids and a careful history, a definite and accurate diagnosis can be made in most cases.

The only treatment is removal through the natural passages or by direct operation. Without operative treatment a relatively small stone may be expelled. If the stone is lodged in the ureter, the discomfort and disability may be greater than if the stone is free in the kidney pelvis. The stone may increase in size as shown in X-ray plates taken three years apart.

For operative treatment pyelotomy is preferred to nephrotomy, and immediate suture is advised both for incisions in the kidney pelvis and the ureter.

Removal of urinary stones usually leaves untouched the anatomical conditions which accompanied their formation and discovery; therefore the author is in favor of Fowler's suggestion of altering the axis of the kidney after removal of renal stone and of occasionally dilating the ureter after the removal of ureteral calculi.

**Eisendrath, D. N.: Varieties of Ureteral Strictures.**

*Surg. Clin. Chicago*, 1918, ii, 95.

The author reports a case of congenital stricture of the ureter in a young man twenty-nine years old who had symptoms for the past eight years of chills, fever, and pain in the right lumbar region. The diagnosis of gall-bladder infection was made, and the individual underwent operation with no relief. When he was correctly diagnosed and operated upon, the relief was immediate and permanent.

The author shows the value of cystoscopy and ureteral catheterization combined with pyelography in this type of case.

A phenolsulphonephthalein functional test was made on the opposite kidney and consequently the author knew that he could remove the infected right kidney with very slight operative risk to the patient. There were many adhesions around the infected kidney, and the only way it could be removed was by the subcapsular method of nephrectomy.

Stricture of the ureter may be classified as: (a) congenital, including (1) valve formation; (2) actual narrowing more or less complete; (3) spiral twists; (b) including under extrinsic causes (1) com-



pression by neoplasms; (2) accessory vessels to the lower kidney; (3) trauma to the peri-ureteral tissues; and under (c) intrinsic causes (1) inflammatory; (2) secondary to tuberculosis of the kidney or bladder; (3) secondary to impacted calculus; (4) primary carcinoma of the ureter.

The author showed cases of congenital stricture of the ureter and discussed the etiology, pathology, and symptomatology very thoroughly. He also showed cases due to external trauma and internal trauma from calculi impacted in the ureter causing ulcerative lesions whose subsequent healing produced stenosis.

The author sums up his work as follows:

The clinical pictures under which ureteral strictures appear are, as a rule, the following:

1. Recurrent attacks of colic-like pain simulating appendicitis, ureteral calculi, and kinking of the ureter due to movable kidney. In every doubtful case of appendicitis one should never neglect a thorough examination of the urinary tract as a routine procedure before operation is done.

2. The appearance of a tumor in the kidney region may be the first sign of the presence of a stricture or obstruction of the ureter.

3. Evidences of renal infection, chills, fever, etc., with or without previous symptoms, like tumor or ureteral colic, may be the predominant feature of the case.

4. Unusually severe reactions from ureteral catheterization, either in the form of pain or symptoms of infection, are recorded by Hunner as of great importance in leading one to suspect the presence of ureteral stricture.

Instrumental examination, i.e., the introduction of bougies of different calibers, supplemented by ureteral pyelography, is the only accurate method of making a diagnosis of ureteral stricture when a renal tumor is not present. In passing the ureteral bougies or catheters in suspected cases one must not overlook the fact that the instrument may catch in the folds of mucous membrane and in the inexperienced hand lead to the diagnosis of true ureteral obstruction. For the purpose of determining the caliber of the stricture, the use of a set of bougies like those shown in an accompanying figure is necessary. These are easier to insert, as a rule, in the female than in the male. Garceau's tapering catheter is also of great value in the diagnosis and treatment of such strictures. If the presence of infection contraindicates the use of the dilating bougies or if the stricture is of an impermeable character, operative procedures must be considered.

For stricture at the upper portions of the ureter a form of plastic operation after the manner of performing pyeloplasty by the Heineke method has been successful in a number of cases. End-to-end anastomosis and similar methods of ureteral anastomosis have never been successful in the human on account of the infection present, as well as the tendency to stricture formation at the point of anastomosis.

At the lower end of the ureter if the dilatation is unsuccessful one must consider the advisability of dividing the ureter above the point of stenosis and reimplanting it into the bladder by one of the generally accepted methods of performing this operation.

In cases of impermeable stricture and in those accompanied by a considerable degree of hydronephrosis, as in the case reported, nephrectomy with removal of the ureter down to the point of stricture as the only method of procedure.

Operative treatment of congenital strictures does not differ from that of the acquired variety except that the question of operative procedure is much more difficult to solve on account of the enormous dilatation, with the resulting thinning of the walls of the ureter above the point of stenosis.

V. D. LESPINASSE.

### BLADDER, URETHRA, AND PENIS

**Borobio, P.: Bladder Calculi in Infancy** (Los cálculos vesicales en el niño). *Arch. Españ. de Pediat.*, 1918, ii, 65.

The author thinks that textbooks on pediatric surgery do not give to bladder calculi the importance they deserve. In the course of a practice of thirty years he has met and operated upon 68 such cases in his pediatric clinic in Saragossa.

Bladder calculi in children occur most frequently from the second to the fifth year. The ages in the author's cases were as follows: two years old, 4 cases; three years old, 11 cases; four years old, 13 cases; five years old, 9 cases; six years old, 8 cases; seven years old, 5 cases; eight to thirteen years old, 18 cases. Two were female and 66 were male children.

The chemical composition of the calculi was in 5 cases uric; in 24 cases oxalic; in 35 cases phosphatic; in 4 cases mixed.

The general rule is that the calculus is single; multiple calculi are rare. In only three of the cases were two stones found, and in no case more than two.

The presence of a bladder calculus is revealed by three symptoms: pain, urinary incontinence, and hæmaturia. Pain is never absent. There is painful and difficult micturition. Incontinence is the rule, though it is not so constant a symptom as pain. It is varied in degree and kind. True hæmaturia is very rare in the calculous child and the author has never seen it in any of his cases.

A child with a history of long-continued suffering on urinating, with intense pain, incontinence, and occasionally the expulsion of a drop or two of blood, who does not respond to medical treatment, may be presumed to have a vesical calculus. The diagnosis can usually be verified by catheter examination and radiology. In 9 cases out of 10 the metallic sound will meet the calculus. But such cases in which the catheter fails can easily be determined by radiology. Even the uric acid calculi give positive findings.

The author reviews the various operative procedures for bladder calculi. For various reasons he considers most of them inapplicable to young children but thinks that suprapubic or hypogastric cystotomy is the operative method of choice in the child. It has none of the grave inconveniences of the perineal route, it is relatively easy, and has a well established technique which does not call for a specialist.

Borobio uses chloroform as an anæsthetic. He does not use a Peterson rectal inflator. The bladder is injected with boric solution; lateral retractors are placed and also a retractor on the superior angle of the wound and fundus of the prevesical sac. The bladder is incised and the calculus is extracted by forceps. There is no lavage. In his first 23 cases the Perier-Guyon syphon tube was used, but in the remaining cases the bladder was sutured with very fine silk in a single plane. In closing the opening a drainage tube is placed in Retzius' space, and a Nelaton urethral sound remains for five or six days.

The author's mortality for the hypogastric operation has been 6 per cent. The deaths which were due to urinary infection occurred from the fifth to the eighth day.

Borobio is satisfied that vesical calculi recur. In his 66 cases there were 3 recurrences, or about 5 per cent.

W. A. BRENNAN.

**Cook, P. H.: An Unusual Case of Vesical Calculus.** *Interst. M. J.*, 1918, xxv, 419.

Cook reports a patient thirty years of age who had a right inguinal herniotomy three years before. Eighteen months after the operation urinary symptoms developed, the cause of which was diagnosed by one man as a neoplasm. Local treatment however removed the symptoms for a year; then they reappeared with greater severity. A cystoscopic examination by another man resulted in a diagnosis of vesical diverticulation with stone formation. Radiograms showed an oval stone just to one side of the midline. Cystoscopy one week later again showed the stone, but no diverticulum was present. The stone proved to be hanging from the wall of the bladder by one of the silk sutures of the hernia operation. Its removal was followed by uneventful recovery.

HARRY CULVER.

**Loumeau: A Large Vesical Calculus Dating from Infancy** (Gros calcul vésical de l'enfance). *Gaz. hebdom. d. sc. méd. de Bordeaux*, 1918, xxxix, 53.

Loumeau recently removed from a young man aged twenty-two a vesical calculus weighing 100 grams, as large as a fair sized potato. It was removed by the hypogastric route. The calculus was composed chiefly of uric acid covered with a thin coating of phosphates.

The size of the stone and a history of bladder troubles left little doubt that its formation began at about the age of eight years at least. Since then the patient suffered much pain which became exag-

gerated with the progress of time. There was frequent painful micturition and incontinence up to the sixteenth year, succeeded by incessant polyuria, etc. He was called to military service and his case was treated as a congenital stricture of the urethra. He was finally transferred to the author.

He then showed purulent, bloody and fetid urine. In spite of most desperate efforts he could not empty the bladder. A bougie introduced into the bladder gave negative results. A metallic sound introduced later discovered the calculus, which was removed under a suprapubic cystotomy. The bladder wall was much thickened, the stone being fixed on the right side below and behind the corresponding prostatic lobe, which also was much congested and enlarged. The patient recovered after a slight postoperative infection of the wound and an abscess of the right prostatic lobe.

W. A. BRENNAN.

**Cathelin, F.: War Wounds of the Bladder** (Blessures de guerre de la vessie). *Lyon chirurg.*, 1918, xv, 109.

Cathelin's study of bladder war wounds is based on the personal observation of 29 cases; 15 of these were shell wounds and 14 were bullet wounds. Sixteen entered posteriorly or in the ischiatic region, 11 being right-sided; 7 were anterior, pubic or suprapubic; 4 were lateral in entrance. In only 5 cases was there an outlet orifice, and in the same number of cases there was a concomitant wound of the rectum.

With regard to symptomatology, in 17 cases there was an issue of urine through the orifice; in 11 cases there was hæmaturia, two being very severe and almost fatal. In one of these the hæmorrhage was primary, in the other secondary. In 7 cases there was primary retention of urine; in 5, signs of cystitis. In three cases there was an injury of the pelvic bones, there being in these cases no calculus in the bladder. This shows how the statistics of different authors vary, since Legueu has noted 10 vesical calculi associated with 10 fractures of the pelvic girdle, although in 22 cases of wound without fracture he found no calculus.

With reference to the projectile, in 8 cases it was in the bladder; in 4 cases there were secondary calculi; in 4 cases there were bone spicula in the bladder.

The method of exploration was in 10 cases cystoscopy, in 10 radiographic and in 5 cases radioscopy examination.

Spontaneous expulsion of a foreign body from the bladder in the course of miction occurs only when the body is very small. Ablation by the natural route depends on the size of the foreign body, and the surgeon must decide on the possibility of this method.

When operative intervention is necessary Cathelin considers the hypogastric route the best, as it is simple and rapid. The perineal route traumatizes the urethra and is liable to cause incontinence. But whatever may be the method of procedure, the removal of foreign bodies in the bladder has a good



immediate and late prognosis. Immediate suprapubic cystotomy is recommended in the following cases: (1) in profuse hæmaturia with anterior perforation of the bladder or with a posterior entrance without exit; (2) in peritonitis following intra-peritoneal injury; (3) in associated lesions involving the rectum. Cathelin recommends Freyer's technique for cystotomy. The mucous membrane of the bladder should not be sutured to the skin.

With regard to associated injuries and secondary lesions, it is observed that about one-third of the bladder injuries submitted to an early operation at the front have later to undergo further operative treatment in the interior hospitals, either for a persistent fistula, an evagination of the wall, or on account of incomplete exploration which has left a second foreign body in the bladder. Hence Cathelin strongly recommends suprapubic deviation of the urine as the primary operation, especially in the conditions above mentioned, a permanent catheter being fixed to the skin by a few stitches. Later in the rear prosthetic hospitals operations and the removal of foreign bodies can be done when necessary.

The results obtained by Cathelin in his 29 cases were 26 recoveries and 3 deaths. Two of the deaths were immediate owing to the gravity of the cases and one was due to tetanus developing eight days after operation. There were 2 cases of iliac anus and three developed abscesses in the vicinity.

While surgery may save the patient with a serious bladder injury, yet Cathelin thinks that as a matter of prophylaxis the bladder should be emptied before soldiers go into action. If an abdominal injury is then received, it will involve the intestine alone, usually without an associated bladder injury, and will render the prognosis much brighter. Many bladder wounds can be avoided by systematic orders to this effect by regimental commanders.

W. A. BRENNAN.

**Mendez, A.: Vesical Miasis** (Miasis vesical). *Rev. de med. y ciruj.*, Habana, 1918, xxiii, 185.

In a very large bladder calculus removed from a patient after hypogastric section a number of larvæ of miasis belonging to the group *Lucilia macellaria* were found. The larvæ, which emerged from small peripheral orifices of the calculus, were similar to those met with in nasal, auricular, and cutaneous miasis. The species referred to is quite common over the whole American continent.

The vesical variety is explained by eggs deposited in the urethra carried into the bladder and giving origin there to the larvæ.

W. A. BRENNAN.

**Pedersen, J.: The Proof of Cure in Gonococcal Urethritis.** *Internat. J. Surg.*, 1918, xxxi, 168.

The author says the chief concern at the present time must of necessity be prevention by treatment, and the ability to decide when the infected have become free from infection.

He says the test period depends on the estimate of

three factors: (1) the virulence of the infection; (2) its hold upon the patient as measured by the complications he has had; (3) his power of resistance or recuperation.

The present tests are: (1) the provocative test, by allowing the patient to drink freely of beer; by instilling a solution of silver nitrate into the whole urethra, or by giving him a full dose of an anti-gonococcus vaccine; (2) microscopical examination after staining the secretion expressed from the seminal vesicles and prostate; (3) culture of the expressed secretion; (4) the complement fixation test.

Pedersen claims that a test practical and at the same time clinically reliable is the combination of the provocative test and culture of the expressed secretion. An instillation of nitrate of silver solution is more convenient for a provocative test than resorting to beer or to a vaccine. The combined test is made at intervals of from one to four weeks until two consecutive negative tests have been obtained; the patient may then be dismissed. LOUIS GROSS.

## GENITAL ORGANS

**Lespinasse, V. D.: Impotency; Its Treatment by Transplantation of Testicle.** *Surg. Clin. Chicago*, 1918, ii, 281.

The author insists that an accurate diagnosis of the type of impotency should be made in each case. They should be classified according to the following table:

1. Loss of testicles, (a) by accident; (b) by disease.
2. Psychic changes.
3. Structural changes in the central nervous system, particularly injuries and diseases of the spinal cord.
4. Hypoplasia of the testicle, (a) congenital; (b) acquired (internal secretion cases).

Congenital and acquired hypoplasia of the testicle are the only types of impotency that should be treated by transplantation of the testicle.

The psychic and the structural type of case should have appropriate treatment directed toward their etiological factor or factors. The etiological factor in the hypoplasia of the testicle case is the absence of the internal secretion of the testicle. This can be corrected by feeding large amounts of desiccated animal testicle or by transplantation of the human testicle.

The two techniques used to transplant human testicles are en masse or by morcellation. In the author's work he has used the morcellation method entirely. Transplantation with blood-vessel anastomosis is of interest only from a scientific and experimental standpoint and has not proved practical clinically.

The changes occurring in the transplanted testicle are well shown by two photomicrographs showing the interstitial cells of Leydig together with their granules. The results in some of these cases of transplanted testicle are little short of marvelous; in others the results are not so good.

**Hyman, A.: Anatomic Results after Prostatectomy.** *Internat. J. Surg.*, 1918, **xxi**, 158.

The author has made a study of the mechanism of urination following suprapubic prostatectomy and the changes in the topography of the bladder resulting from the operation, that additional light may be cast upon the question of postoperative incontinence of urine.

Considerable discrepancy exists concerning the rôles played by the internal and external sphincters. In order to better determine the changes following the operation, Hyman made a series of radiographs of unoperated cases, with the result that marked changes of the bladder were observed. Changes characteristic of prostatic enlargement were found at the base of the bladder, the inferior portion of the bladder was found to be broad and flat or sinuous; at times there was an upward bulging, due to the gland projecting into the bladder. He considered the flattening of the inferior portion of the organ due to the prostatic enlargement. The bladder was situated on a higher plane than normal, the level depending upon the size of the gland. Its base was found to be opposite the upper border of the symphysis, or more often one or two centimeters higher. Even in the most extreme distention of the bladder, the internal sphincter is the seat of closure.

The author selected 38 prostatectomies for this study, and 75 radiographs were taken at various intervals following operation, ranging from two months to three years; the most interesting changes were noted at the outlet of the bladder. In a small group of cases the internal sphincter was not sufficiently injured by the operation to interfere with its proper function. In the great majority of the cases, the radiographs showed two distinct cavities, a larger, superior one corresponding to the bladder proper, and a smaller, inferior one extending from the lower margin of the bladder and continuous with it, to the region of the "compressor urethræ," the latter corresponding to the defect left by the removal of the enlarged gland.

Radiographs taken after an interval of three years show that the sphincter has either partially regenerated after the operation or was incompletely destroyed by it, and that the cavity left by the enucleation of the gland is not entirely obliterated, and that the internal sphincter is not completely regenerated.

In conclusion, the author says that: (1) the internal vesical sphincter is the true sphincter of the normal bladder, and of the bladder in prostatic enlargement; (2) the "compressor urethræ" is the functioning sphincter after suprapubic prostatectomy in the large majority of cases. LOUIS GROSS.

**Martin, C.: End-Results in the Prostatectomized Patient; a Comparative Analysis, Based on 110 Cases.** *J. Am. M. Ass.*, 1918, **lxx**, 1287.

By means of a printed questionnaire sent to a considerable number of general practitioners, Martin has collected important data regarding the

end-results in 110 prostatectomized patients, 55 of whom were operated upon suprapubically and 55 perineally. The operations had been performed by urologists, general surgeons, general practitioners, and gynecologists. Attention is called to the even balance in numbers of each type of operation, showing that the perineal route is still in favor in many instances; however, 1916 statistics give the perineal route but two-thirds the number of the suprapubic.

In this series the ages of the patients operated upon suprapubically averaged two years greater than those operated upon perineally. While 61 per cent of the suprapubic wounds were closed within four weeks, only 42 per cent of the perineals were so fortunate; and whereas 100 per cent of the suprapubic wounds were closed within one year only, only 84 per cent of the perineals had done so, 6 per cent of the remainder having permanent fistulæ.

Since frequency of urination is often the symptom which brings the patient to seek surgical relief, the changes in this factor were carefully analyzed, showing that among the suprapubic cases the day results were good in 81 per cent, fair in 13.5 per cent, and poor in 5.4 per cent; while among the perineal cases the day results were good in 66 per cent, fair in 27.7 per cent, and poor in 5.5 per cent. As to nocturnal frequency, the results from suprapubic operation were good in 82 per cent, fair in 5 per cent, and poor in 11 per cent; while in perineal cases the results were good in 44 per cent, fair in 23 per cent, and poor in 31 per cent of cases.

Concerning bladder control, 80 per cent of the suprapubics have full control, 15 per cent partial control, and 4.3 per cent complete incontinence, whereas 64 per cent of the perineals have full control, 22 per cent partial control, and 14 per cent complete incontinence.

The comfort of the patient depends to no small degree upon the extent of cystitis, hence this element is of importance and it has been found that 35 per cent of the suprapubic have some degree of cystitis, while 31 per cent of the perineals are so afflicted; again, where 21 per cent of the former class have some type of pain, only 16 per cent of the latter are thus bothered.

The preponderance of urethral trauma following perineal operation is clearly shown when it is seen that 23.2 per cent of these patients have actual urethral stricture resulting, against 6.5 per cent for the suprapubic route. This factor may also be of importance in the production of vesical calculi, since 4.1 per cent of the perineals later developed stone, while none of the suprapubic were found to be thus complicated.

There are no marked differences observed in the force of the stream or the character of the urine of the two routes; the effect on the sexual power of the patients is somewhat more favorable in the suprapubic, as also is the effect on the general health of the individuals.



Martin believes that it is well that the perineal operation is losing favor, as in practically all of the consequential factors analyzed, the suprapubic method has a big advantage in results obtained.

HARRY CULVER.

### MISCELLANEOUS

**Chalier, A., and Glénard, R.: War Wounds of the Genito-Urinary Organs** (Plaies des organes génito-urinaires). *Rev. de chir., Par.*, 1917, liii, 552.

The authors had 15 cases of extensive urethral injuries, of which detailed clinical histories are given; 12 of these were bullet wounds and 3 were shell wounds. The penile urethra was the site in 5 cases, the perineoscrotal in 9, and the prostatic urethra in 1. In the majority of the cases the trajectory of the projectile was anteroposterior. In a few cases the course was from the front backward, irregularly oblique or transverse. The direction of the trajectory is determined by its entry and outlet orifices where both exist, or by radiography, except in cases where it is observed at operation. In 9 of the cases the lesion found at operation consisted of a complete or incomplete section of the urethra. The cases of complete section were distributed as follows: balanic portion, 1 case; sub-balanic portion, 1 case; penoscrotal angle, 1 case; perineoscrotal, 2 cases. The maximum separation of the two ends did not exceed 2 cm.

Clinically urethral wounds show urethrorrhagia and disturbances of miction. In only severe cases does retention persist beyond the first twenty-four hours; catheterization is then possible. In the majority of cases the patient urinates spontaneously partly or wholly through the external wound. Such symptoms exist in two-thirds of the cases, and are very valuable when a lesion of the canal is not known positively or suspected. Infective phenomena are later and less severe in urethral wounds than in wounds of other regions.

The treatment of urethral war wounds does not essentially differ from the treatment of such wounds in civil practice. Generally injuries of the penile urethra not interfering with miction do not call for immediate intervention; on the contrary, perineoscrotal or prostatic urethral wounds call for operation as early as possible; this as a rule should be an external urethrotomy. In 12 of the authors' cases a wide perineotomy and exposure of the wound was done, thus assuring a free outlet for the urine without the use of a retention catheter and avoiding peri-urethral infection. The lesion is generally easily found, and when section is incomplete, there is only slight separation and urethrorrhaphy can be done. When the urethral lesion is very profound and cannot be reached easily through the perineum, the best course to follow is a suprapubic cystostomy. The immediate mortality of the authors' cases has

been 13.3 per cent, but such wounds are usually associated with other injuries more or less severe. In the fatal cases the result was not due directly to the urethral lesion, and the authors consider that the immediate prognosis of urethral wounds is benign. As regards end-results, one case of a prostatic urethral wound died, and two others had stenosis which called for dilatation.

The authors say that war wounds of the penis and scrotum are fairly frequent. Penile injuries, though superficial, may be very extensive, and there may be almost complete circular decortication. In a general way deep penile wounds are not so grave as they might at first appear. Even if there is complete or incomplete urethral section, this lesion is relatively benign. Moreover, though the corpus cavernosa and gland are highly vascular, formidable hæmorrhages calling for a hæmostatic operation do not occur. Lesions of the gland have however this particularity, that they often end in necrosis with loss of detached parts even when the pedicle uniting them with the gland is assured of nutrition. At the same time there is observed a very rapid cicatrization of the remaining part. This effect is observed even when the two parts have been united by sutures.

As regards scrotal wounds, it is of prime importance to know what has happened to the testicles. Some authors hold that the testicle, owing to its mobility, escapes a bullet traversing the scrotum. The authors think this is incorrect. They find that a partial or total testicular hernia through the wound is the rule; sometimes the two testicles herniate at the same time. The testicle itself may be simply perforated, it may be divided into two parts, or it may be completely disrupted.

In all testicular lesions the authors have followed a strictly conservative policy, even when the wound is old. The scrotum is opened up, dressed and the testicle as far as possible left undisturbed. The testicle is maintained as far as possible in its correct place in the scrotum and no attempt is made at either suture or reconstruction unless the injury is comparatively recent, which has not been the cases in the authors' series. If in spite of every effort the testicle remains more or less ectopic and adherent to the envelopes, it will be easy to free and replace it later in its proper position. Examination of cases after a long interval where the testicles were preserved has shown the authors that after having eliminated part of their substance as necrotic, such testicles, even if atrophied, have been non-painful. For various reasons the authors consider such preservation is justified.

In a case of complete section of the spermatic cord the testicle was completely removed on the sixth day. In another case in which the cord was necrotic due to infection, the authors ligated the cord and removed the necrotic testicle. Recovery was rapid.

W. A. BRENNAN.

# SURGERY OF THE EYE AND EAR

## EYE

**Roy, D.: Removal of Foreign Bodies from the Eyeball and Orbital Cavity; Report of Cases.** *South. M. J.*, 1918, xi, 386.

The author reports better results from the use of the hand electromagnet such as Johnson's, introducing the point within the eye, than the Haab giant magnet.

Five cases of foreign body injury are cited.

In Case 1 a particle of steel had cut through the cornea and lodged in the posterior chamber and phthisis bulbi would have been the prognosis. After removal the pupillary area became filled with cicatricial exudate and opaque lens matter, yet an iridectomy gave 20:70 vision.

In Case 2 a particle of brass was hidden behind and so entangled in the iris that it could only be removed by pulling the iris upward from the pupillary border when the assistant could see and grasp the piece, the iris dropping back without injury or distortion of the pupil.

Cases 3, 4 and 5 are of steel or shot in the sclera or orbital tissues, and the author says, "When one considers the damage that can be done by surgical interference to muscles, nerves, and blood-vessels in the deeper parts of the orbit, a conservative course is the better one, the foreign body being allowed to remain unless there is urgent demand for its removal."

S. S. HOWE.

**Hoare, W. W.: Some Points in the Operative Technique and After-Treatment of Senile Cataract Extraction.** *Med. J. Austral.*, 1918, i, 297.

The various modifications of the operation for cataract the author compares to the many procedures used for hæmorrhoids, suggesting that the differences are due less to the value of the methods than to personal adaptation or initial success or failure.

Waiting for maturity with its accompanying blindness is ill-advised, as good results having been obtained from operating on immature as on mature cataracts, visual failure below seeing ordinary objects determining the time for operation.

A ring-shaped incision of the anterior capsule, getting the cystotome well under the edge of the iris sphincter all around, and irrigation of the anterior chamber, renders iritis or later capsulolenticular cataract unlikely. Argyrol, 25 per cent, is used three times a day for three days before operation.

The Langs retractor is used by the assistant to hold the lids away from the eye and the operator's feeling of security is regarded as outbalancing the objection of having the assistant's hands in the way.

Peripheral iridectomy is done, as the usual coloboma causes too much dazzling, especially in the Queensland climate, and it is also not so desirable cosmetically. A moderately large lens can be extracted through a small pupil if done slowly, remembering that the sphincter pupillæ can be tired out just as the sphincter ani. Eserine, 0.5 per cent, is instilled to guard against iris prolapse. Aged patients are gotten out of bed in two days when possible and the eye protected by only a wire mask when once the wound is sealed.

S. S. HOWE.

**Carhart, W. M. D.: Differential Diagnosis and Treatment of Follicular Conjunctivitis.** *Med. Rec.*, 1918, xciii, 540.

Much good and no harm is done by sending children with follicular conjunctivitis to the Children's Clinic with the diagnosis of trachoma, as the vigorous treatment clears up both diseases and isolates all trachoma cases.

The author enumerates the points of differential diagnosis between the two diseases, emphasizing the deep location of the follicles in trachoma and the enlargement of the capillaries between them, the mucous membrane in follicular conjunctivitis being normal.

A very early sign of trachoma, noticed quite often, is an involvement of the ocular conjunctiva in the form of a ring of gelatinous granules deep in the fornix and gradually spreading forward to a considerable distance on the eyeball. This can be demonstrated by causing the patient to look down very strongly and then gently raising, not everting, the upper lid.

Follicular conjunctivitis should be treated carefully, not because it is in itself a dangerous disease, but because more serious infection is practically invited. This explains cases which apparently begin as a follicular conjunctivitis and then develop suspicious symptoms leading one to doubt the first diagnosis. The author recommends 5 per cent copper citrate ointment and massage, either in the form of the bichloride rub or of opthalmol solution on a cotton wound applicator.

S. S. HOWE.

**Murray, W. R.: The Vestibular Apparatus and Its Relation to Aviation.** *J. Lancet*, 1918, xxxviii, 155.

The anatomy and physiology of the semicircular canals and cochlea are briefly reviewed.

A stimulus applied to one semicircular canal determines the integrity not only of that canal but also of the pathway leading to the eye muscles and the cortical centers of the brain. The ability of the individual to maintain equilibrium depends on his vestibular apparatus, his visual apparatus, and his muscle sense. Deprivation of two of these



results in serious trouble, while loss of one factor still permits equilibrium. This is illustrated by the tabetic who has lost the muscle or arthrodial sense, by the deaf mute who has lost both internal ears, and by the blind who have only vestibular and muscle sense remaining. It is of the utmost importance that the aviator should possess all three, and most important is the vestibular apparatus, as when flying in clouds he must depend on this to maintain balance and orientation.

Impairment of the function of one or more of the semicircular canals may be the result of scarlet fever or other infection, hearing may be perfect, and on the ground the individual may apparently have a normal sense of equilibrium.

The method of examining the vestibular apparatus has been standardized by the army and is carried out by means of the turning chair, supplemented by the caloric test which has the advantage of testing the labyrinths separately. In the routine examination only the turning tests are used, the caloric being reserved for doubtful cases or to confirm the findings. The examination consists of the nystagmus tests to determine direction, amplitude, and duration of the nystagmus, past pointing to determine the vertigo induced by stimulation of the horizontal canals, and falling tests to determine vertigo due to stimulation of the vertical canals. Abnormal reaction is a cause for rejection.

S. S. HOWE.

**Brose, L. D.: Ocular Tuberculosis.** *J. Indiana St. M. Ass.*, 1918, xi, 113.

In the conjunctiva one may meet with three varieties of tuberculosis: (a) an acute miliary form, rapid in course, involving by choice the tarsal covering; (b) an ulcerative form of long duration; and (c) a diffuse swelling of the conjunctiva with follicular enlargement affecting usually one eye and accompanied by little pain, even though the cornea be involved.

Phlyctenular conjunctivitis is not regarded as tubercular, the fact that tubercle bacilli have been found in the lesions being explained by the high percentage of infections with tuberculosis, the findings being contaminations from foci elsewhere.

Foreign bodies bearing tubercle bacilli, by getting into the eye render infection possible, and Fuchs cites the fact that such ulceration is frequently seen beginning in the sulcus subtarsalis where foreign bodies usually lodge.

Tarsal and lid ulcers are treated by focusing the sun's rays for a few minutes every three or four days on the ulcerated surface, and in the follicular form carbon dioxide snow may be used.

Scleritis, keratoscleritis, and episcleritis have in recent years been more and more connected with tubercular infection, especially with nodular formations.

The diagnosis of tuberculosis rests on macroscopical appearances, histological examination, experimental test implanting a portion of tissue in

a rabbit's eye, and the biological reaction with tuberculin. The cause and nature of the tuberculin reaction, no matter which preparation is used, is the same, the difference being simply one of degree. The most plausible theory is that a toxæmia is brought about, the tissue cells resist the specific toxins by forming antibodies, and these protect against further invasion. It is proper to administer tuberculin as an antigen, but one must not expect the production of antibodies with equivalent immunizing value such as occurs in typhoid fever serum, for tuberculin is of far more value as a diagnostic agent than as a curative one.

The Calmette method is not without danger of permanent injury to the diseased eye.

S. S. HOWE.

**Fernandez, J. S.: Diseases of the Eyes in Cuba.** *N. Orl. M. & S. J.*, 1918, lxx, 717.

The history of scientific work in Cuba dates from the taking of Havana by the English in 1861. Knowledge of the eye was not cultivated and the first notice of Cuban ophthalmology was by Carron du Villards, an Italian, who states that the eye disease brought from Africa by negro slaves was not trachoma, and if trachoma ever got a foothold it did not thrive because of the regard for the living conditions of their costly chattels by the plantation owners. The visit of du Villards to the home of yellow fever is regarded as noteworthy, as such temerity cost Valli, of Pisa, and Antommarchi, physician to Napoleon I, their lives.

Quinine amblyopia was common forty years ago owing to the massive doses used, but few cases are seen now because of more rational treatment.

Pure nicotine amblyopias, without the addition of alcohol, are often observed, but in the war in 1875 with the increase in the consumption of alcohol, and less food, visual disturbance was very frequent.

Lacrymal disease is scarcely found in Cuba owing to the wide lacrymal canals of the natives.

Hemeralopia, as observed in sailors and sponge fishermen, the author attributes to the intense light and anæmia.

S. S. HOWE.

**Green, J., Jr.: The Treatment of Pneumococcus Ulcer of the Cornea with the Thermophore.** *South. M. J.*, 1918, xi, 251.

Experimentally and clinically Green has confirmed the value of the thermophore as developed by Shahan in the treatment of pneumococcal ulcers of the cornea. The method followed was the direct application of a metal tip at a temperature of 158° F. to the ulcer for one minute. Experimentally the cultures following this were negative and the clinical results satisfactory.

E. B. FOWLER.

**Carr, A. M.: The Narrowing of the Pupil Does Not Lower Normal Intra-Ocular Tension.** *Arch. Ophth.*, 1918, xlvii, 177.

The desirability of determining if myotics cause lowering of normal intra-ocular tension is shown in

three types of cases: (a) borderline glaucoma, in which a tension of 25 mm. is often noted and may or may not be reduced by a myotic; (b) simple glaucoma in one and normal tension in the other; and (c) inflammatory glaucoma in one eye and normal tension in the other eye.

The Schiotz tonometer was used and the tension taken before and after the instillation of 1 or 2 per cent of eserine salicylate in patients who gave no history of eye trouble and whose ages varied from twelve to sixty-seven years. In no case was there a lowering of tension greater than three mm. following the contraction of the pupil.

The author does not however postulate that decrease of tension under a myotic necessarily means that an eye is glaucomatous. S. S. HOWE.

### EAR

**Stimson, G. W.:** *The Static Labyrinth.* N. Y. M. J., 1918, cvii, 539.

The author states that the static labyrinth is not the only organ of equilibrium, as it is in intimate connection with other special senses, such as sight, touch, muscle and joint sense in the maintenance of balance. But the end-organ of the static sense differs from the others in that its only function is that of the maintenance of balance, whereas with the others it is merely a collateral function. Therefore, whenever perfect equilibration is interfered with and the sensation of vertigo is produced, the attention should chiefly be directed to the static labyrinth.

The various conditions causing vertigo are:

1. Primary disease of the labyrinth, labyrinthitis of the various types, hæmorrhage or effusions; embolus of the labyrinthine artery, e.g., air embolus in caisson workers; irritation of the labyrinth occurring during a middle ear inflammation, such as acute otitis media; sudden destruction of the labyrinth, rarely by trauma, but usually by hæmorrhage or serous effusion, in diabetes, Bright's disease, or where the vascular system is affected; neuritis of the eighth nerve resulting from some chronic focus of infection, such as chronic disease of the faucial tonsils, pyorrhœa alveolaris, etc.; most frequently of all a primary chronic degenerative process within the labyrinth, independent of syphilis or infectious fevers.

2. Toxæmias affecting the vestibular apparatus, such as ptomaine poisoning, constipation, alcohol, quinine, tobacco, lead poisoning, nephritis, gout, rheumatism, syphilis, and infectious fevers such as scarlatina, typhoid, mumps, etc.

3. Definite lesions within the brain itself along the pathways from the ear, such as tumor, hæmorrhage, thrombus, infarct, abscess, gumma, tubercle, specific neuritis, multiple sclerosis, syringomyelia, polio-encephalitis, or meningitis.

The information to be derived from the ear tests consists of the presence or absence of normal reactions, or their deviations from the normal. If

after stimulation there occur no reactions whatsoever, no nystagmus, no vertigo, no past pointing, no falling, etc., the lesion is either in the labyrinth or the eighth nerve. If stimulation of the labyrinth evokes perfectly normal responses, nystagmus and vertigo, there is evidently no impairment of the vestibular apparatus, and if it is for a cause of dizziness that one is searching, he must look elsewhere for something that is producing an irritation of the balance mechanism. If any of the responses go through normally, the labyrinth and eighth nerve as the seat of the lesion are eliminated. If stimulation of the ear fails to produce any nystagmus, there must be a lesion along the pathway from the ear to the eyes in the vestibulo-ocular tract. If no vertigo results, there is a lesion along the pathway from the ear to the cerebral cortex, the vestibulo-cerebello-cerebral tract.

If after stimulation the patient shows nystagmus and no vertigo, or vertigo and no nystagmus, the lesion is not labyrinthine. The presence of normal nystagmus with absence of vertigo would indicate a normal tract from the ear to the eyes but an involvement of the other pathway, the one from the ear to the cerebrum, after the two have divided into their individual tracts, i.e., between Deiter's nucleus and the cerebral cortex. The presence of a normal vertigo and the absence of nystagmus would indicate a lesion along the fibers going to the eye muscle nuclei at some point beyond the division of the two pathways into their individual tracts, i.e., between Deiter's nucleus and the posterior longitudinal bundle.

In conclusion, the author summarizes as follows:

The static labyrinth is the essential organ of balance.

The labyrinth, together with its various nerve pathways, constitutes the vestibular apparatus or balance mechanism.

A disturbance of any portion of the vestibular apparatus gives rise to vertigo.

It is only a disturbance of the ear or its associated pathways, and nothing else, that can induce vertigo. When disease in remote organs causes dizziness, it is only because of a definite influence on the ear mechanism.

These tests afford an accurate and scientific method of determining the integrity of the internal ears, the eighth nerves, and the pathways through the medulla oblongata, the pons, the six cerebellar peduncles, the cerebellum itself, and the cerebral crura to the cerebral cortex.

In cases of vertigo of doubtful etiology, examine the vestibular apparatus. OTTO M. ROTT.

**Huntington, W. H.:** *Mastoiditis.* Med. Rec., 1918, xciii, 849.

After a few historical and anatomical remarks, the author discusses: (1) the etiology, stating that adenoid hypertrophy is one of the greatest etiological factors in middle ear trouble and subsequent mastoid invasion; (2) symptomatology; (3) diagnosis



and aids to same; (4) indications and contra-indications to the operation.

The following indications are mentioned:

1. Cases of acute mastoiditis, with persistent pain on pressure over the tip or antrum. Persistence of fever after a successful paracentesis has been done, or in which a sagging of the postero-superior meatal wall is found.
2. Cases of acute suppuration of the middle ear with dizziness, vomiting, nausea, or beginning facial paralysis, or with signs of intracranial or labyrinthine involvement.
3. Cases of long-standing middle ear suppuration which resist all local measures, and because of good hearing and other reasons do not indicate a radical mastoid.
4. Cases of persistent mastoid pain, either with or without other symptoms, which cannot be accounted for in other ways.
5. Cases of subperiosteal abscess.

OTTO M. ROTT.

**Hays, H.: Tubercular Mastoiditis; Radical Operation Under Cocaine Anæsthesia.** *Ann. Otol., Rhinol. & Laryngol.*, 1917, xxvi, 938.

From a case of tuberculous mastoiditis upon whom a radical operation under cocaine anæsthesia was performed, the author has deduced the following practical points:

1. The radical operation can be done under local anæsthesia without pain.
2. The superficial scalp tissues and periosteum are sensitive, but bone has absolutely no sensation.
3. The mucosa of the middle ear is extremely sensitive and must be separately cocainized.
4. Irritation or destruction of the facial nerve is immediately noticeable to the patient.
5. The after-effects are practically nil.
6. The end-result is just as good under local as under general anæsthesia.

OTTO M. ROTT.

**MacKenzie, G. W.: Syphilis of the Inner Ear and Eighth Nerve.** *Am. J. Syphilis*, 1918, ii, 241.

The points of chief interest to which the author draws attention are:

1. That syphilitic changes in the inner ear are due to extension from either the nerve on the one side or the middle ear on the other.
2. From present knowledge, it is accepted that: (a) primary atrophy of the eighth as well as the second nerve is an accompanying manifestation of parasyphilis; (b) primary atrophy is produced by a pre-existing low grade syphilitic meningitis; (c) eventually the pia mater contracts and squeezes the life out of the nerve.
3. In those cases where the syphilitic meningitis is more pronounced, the inflammation spreads to and involves the nerve, so that the clinical evidence of neuritis manifests itself simultaneously with or

shortly following the meningitis. At a later period the connective tissue elements in the nerve may contract and produce secondary atrophy.

4. Bilateral diminution or complete loss of hearing when found to be due to a lesion of the perceiving apparatus as determined by carefully conducted functional fork tests speaks decidedly for the diagnosis of syphilis.

5. Bilateral diminution or loss of the so-called turning, caloric and galvanic tests likewise speaks for syphilis.

6. Bilateral diminution or complete loss of hearing function from a lesion in the perceiving apparatus combined with bilateral diminution or loss of vestibular function speaks for syphilis.

7. Pronounced loss of either function on one side with but moderate diminution of function on the other speaks equally strong for syphilis.

OTTO M. ROTT.

**Maybaum, J. L.: Factors in the Causation of Tinnitus Aurium.** *N. Y. M. J.*, 1918, cvii, 780.

The author goes into considerable detail in discussing the various manifold causes of dizziness. He divides all cases into two classes:

1. Tinnitus without defective hearing, due to functional disturbance of the auditory nerve center, functional disturbance of the labyrinth, or abnormal condition of the circulatory system.

2. Tinnitus with deafness, due to a pathological condition in the external, middle, or internal ear.

In the former class are those conditions due to arteriosclerosis, anæmia, epilepsy, migraine, toxæmias from overindulgence in alcohol, tobacco and drugs such as quinine and the salicylates. Finally neurasthenia is a factor.

So many helpful suggestions are scattered throughout the article that it is impossible to present them all in a short abstract. For these a careful perusal of the original article is necessary. The following are a few selected at random:

1. It is important in giving a prognosis, to select the facts as to the constancy or intermittency of the noise. The latter type offers a better prognosis, as the causative factor is less likely to be of a permanent nature.

2. Continuous noises may disappear only after the patient becomes completely deaf.

3. Relief following catheterization of the eustachian tube is a favorable sign.

4. In general, the chances for recovery from tinnitus are less hopeful than relief from deafness.

5. It is important to remember that persistent and prolonged treatment is fraught with greater harm to these patients with middle ear disease than entire neglect of treatment. A far better plan is to give two or three courses of treatment of a few weeks' duration with sufficient intervals between them.

OTTO M. ROTT.

# SURGERY OF THE NOSE, THROAT, AND MOUTH

## NOSE

**Stein, O. J.: Pituitary Tumors from the Surgical Standpoint of the Rhinologist.** *N. Y. M. J.*, 1918, cvii, 585.

Speaking of the various ways in which the sella region has been reached endonasally, the author mentions the midnasal method by which the septum is followed all through the operation, the object being to enter the sphenoid sinus and remove its septum and that part of its upper and back wall constituting the floor of the sella upon which the hypophyseal gland rests. Some operators begin the incision external to the nose, others start far back on the septum, while still others, among whom is the author, start in front on the septum, performing first the classical submucous resection of the septum.

Besides this midnasal method are mentioned the lateral nasal method, by which the septum is left intact and the sphenoid is approached either through the nostril by removing one or both turbinates and exenterating the ethmoid labyrinth or by making an entrance first through the maxillary antrum from the oral cavity and then into the ethmoid region. The third method is a combination of the midnasal and the lateral methods.

The points mentioned in favor of the midnasal method are: (1) It is safer because the operation is confined between the membranous flaps of the septum which are brought together afterward, thus shutting off the sphenosella operated area from the nose entirely. (2) Although not the shortest route, it is the more direct because it has the septum as a guide which makes working more certain. (3) It has not the disadvantages of the lateral method which is oblique, and by which the operator must assure himself beforehand of the presence of a sphenoid cell, as well as its size and location, and besides, if a posterior ethmoid cell should occupy the ordinary site of the sphenoid cell, embarrassment may ensue, or the cell may be so small as to limit one's approach to the sella floor.

Whatever method is selected, the author urges the most intimate co-operation with the internist, the neurologist, the ophthalmologist and the roentgenologist.

Several anatomical and pathological findings are mentioned, for which the original article should be read. The principal changes in the gland are hyperplasia, adenomata and cysts.

The author has had experience with nine cases, six males and three females, the ages ranging from thirty to sixty-six years. The chief symptom in all but one was loss of vision. Three showed marked functional pituitary disturbance. Headache was

present to some degree in all. In one it was very severe and almost the only symptom. Eight of the nine cases were operated upon, and the immediate results from operation were a great improvement in symptoms in five. One patient died on the third day, presumably from acidosis; no autopsy was done. One case was complicated by meningitis, but the patient survived. One had a slight hæmorrhage in the left hemisphere but completely recovered in a few days.

The remote effects from operation show one death after one and one-half years from a cyst that was apparently not present at the time the operation was performed, when a large decompression was done for an adenoma. There was a disappearance of the headache in most cases; also the vertigo when present. Sight continued to improve or was maintained in those showing immediate benefits.

OTTO M. ROTT.

## THROAT

**Beck, J. C.: Further Report on the Treatment of Malignant Disease of the Larynx; Management and Statistics of Malignant Disease of the Respiratory Tract.** *Laryngoscope*, 1918, xxviii, 131.

The author discusses: (1) the Percy coagulation method; (2) the diathermia mummification method; (3) deep X-ray penetration; (4) radium in massive doses; and (5) laryngectomy.

The Percy coagulation method was employed in 23 cases as follows: sarcoma, intranasal, 1 case; carcinoma, extranasal, 1 case; carcinoma of the upper jaw, 7 cases; carcinoma of the upper and lower jaw, 2 cases; carcinoma of the naso-, oro- and hypopharynx, 1 case; carcinoma of the lips, 2 cases; carcinoma of the thyroid gland, 1 case; carcinoma of the external ear, 1 case; carcinoma of the tongue, 3 cases; carcinoma of the larynx, 4 cases.

The ultimate cicatricial formation and tenacity of the necrotic mass produced by the method are the objectionable features.

The reasons given for substituting a laryngotomy and removal of the growth by the Percy method for a laryngectomy are:

1. The patient will consent more readily to an operation when he may be promised that he may have a voice, even though it will not be normal.
2. He may even hope to have a normal breathing tube and not have to wear a permanent tracheotomy tube.
3. The operation is not so dangerous as a laryngectomy.

Ultimate results of cases treated are not given.

The diathermia method is mentioned but no results as to cure are cited.



Deep X-ray penetration has proven unsatisfactory for carcinoma, but good results have been obtained in the treatment of sarcoma. The author has had one case of sarcoma of the larynx thus treated with apparent success and several cases of maxillary postnasal and pharyngeal sarcoma which responded remarkably.

Massive doses of radium, 125 mg. for thirty-six hours, resulted in reduction in the size of the sarcomatous growth of the larynx, but the time element is too short to give data upon the ultimate result. Laryngectomy was done in one case, but the ultimate result remains to be seen.

The author has records of 143 cases, 41 of sarcoma and 102 of carcinoma. Of the sarcoma cases 30 were accounted for at a recent date; 11 died. Of the carcinoma cases 73 were followed up to a recent date; 21 are still alive, and 52 dead.

In the paper these summaries are discussed in detail, as well as the report of 4 cases, the only living one of whom is the one on whom a laryngectomy was performed.

Concerning the management of these cases, the author speaks of:

1. The importance of joining the American Society for the Control of Cancer.

2. The earliest possible diagnosis is to be followed immediately by the most radical intervention. This does not always mean surgery.

3. All points of irritation, such as fissures, chronic inflammation, stones, non-malignant growths, foreign bodies and jagged edges, are to be looked upon as precancerous states and should be corrected.

4. When a malignant growth has assumed the proportions of a metastatic growth or involved the neighboring tissues to such an extent as to make life unbearable, were the cancer removed, then in such a case palliative treatment is indicated, and the limit of morphine should be given to prevent the patient from suffering any pain.

5. Should the growth be very large and involving the neighboring structure so completely as to probably leave a large defect in appearance as well as function, and furthermore, should the procedure appear to be so formidable as to offer only a small chance of a permanent cure from cancer, it is one's duty to operate and give such patients that chance.

6. In the removal of particles of tissue for microscopical examination, it must be borne in mind that cutting into a malignant growth will frequently aggravate the process or endanger the healthy neighboring regions from implantation of cancer cells. Consequently Bloodgood has recently recommended the use of an electrically heated knife which will prevent that difficulty and yet not spoil the tissue for correct microscopical diagnosis.

7. The follow-up system of cancer cases is of the utmost importance and the co-operation of the medical profession in making this of practical value is absolutely essential.

Otto M. Rott.

## MOUTH

**Haines, H. A.: Vincent's Angina from the Oral Surgical Standpoint.** *Dental Cosmos*, 1918, lx, 295.

Haines calls attention to the importance of the diagnosing and treating of Vincent's angina by dentists. He defines it as an acute infection of the mouth caused by the action of bacillus fusiformis and a variety of spirillum. The period of incubation is six days. The patient complains of headache and malaise and the tongue is coated; the temperature very seldom exceeds 100° F. The gums around the second and third molars usually show ulceration which may travel forward upon the buccomucosa reflection and also extend backward toward the tonsil region. The ulcerative tissue is necrotic, the color of which is soft grey or a yellowish green.

He recommends treating these cases by giving the patient a laxative and washing the mouth with potassium permanganate solution of 1:3,000. Another treatment is to swab the ulcerated parts with the following preparations: copper sulphate, 10 per cent, Lugol's iodine, phenol in glycerine, 5 per cent, saturated solution of potassium permanganate.

M. N. FEDERSPIEL.

**Ivy, R. H.: Anatomy of the Teeth and Jaws, with Special Reference to Roentgenogram Interpretation.** *Internat. J. Orthodontia*, 1918, iv, 124.

The author calls attention to the fact that familiarity with the anatomy of the teeth and jaw-bones is one of the fundamental essentials for correct interpretation of roentgenograms of these parts. Lack of this knowledge is frequently a cause of the mistaking of normal shadows for manifestations of disease. The sockets of the teeth are lined with a thin plate of dense bone, which is shown in the X-ray negative as a fine white line around the tooth. Between this line and the tooth itself is a narrow dark space representing the periodontal membrane. These lines are important landmarks in interpretation, as their absence or deviation usually means some pathologic condition.

Particular attention is called to the relation of the roots of the teeth to the floor of the maxillary sinus and nasal chamber, and normal anatomical variations are pointed out. Certain foramina and canals also normally appear in roentgenograms and might be mistaken for pathologic phenomena if their anatomical significance were not appreciated. These are the anterior palatine fossa, behind and between the roots of the upper central incisors; the posterior palatine canal, above the roots of the upper molar teeth; the mandibular canal, below the roots of the lower molar and premolar teeth; and the mental foramen, below and between the roots of the lower premolars.

Anatomical landmarks shown in lateral X-ray plates of the face are also pointed out, and illustrated by diagrams.

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## SURGERY OF THE NOSE, THROAT, AND MOUTH

### Nose

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# INTERNATIONAL ABSTRACT OF SURGERY

OCTOBER, 1918

## REPORT OF FOURTH INTERALLIED SURGICAL CONGRESS<sup>1</sup>

HELD AT VAL-DE-GRÂCE, FRANCE, MARCH 11 TO 16, 1918

THE Fourth Interallied Surgical Congress for the Study of War Wounds was held at Val-de-Grâce, March 11 to 16, 1918. The conclusions adopted deal either with new topics or with an intensified study of phases of previously considered subjects which have been in part presented in these pages.<sup>2</sup> Seven problems were considered, namely:

1. Indications and technique for blood transfusion.
2. Physiology, diagnosis, pathology, and treatment of trench-foot.
3. Treatment of pelvic wounds, especially of the bladder and rectum.
4. Pseudarthroses following war wounds.
5. Conservative operations in the treatment of gunshot wounds of the foot.
6. Osteosynthesis in the treatment of war fractures.
7. Analysis of the methods of sterilization of wounds.

After a discussion of the reports submitted on these various questions the Congress adopted the following conclusions:

### BLOOD TRANSFUSION

Blood transfusion actually gives results which suffice for its adoption as the method of choice in the treatment of severe hæmorrhages.

*Indications.* In the early hours after injury the indications are given by the clinical study of the patient. This may be by repeated observation of the blood-pressure and by the red cell count which furnish the indications in limb wounds. In the advanced posts and when circumstances render such examinations impossible, the indica-

tions will be based on the clinical symptoms alone.

In circulatory collapse resulting from a super-acute affection such as gaseous gangrene transfusion has not given a favorable result.

In shock the indications for transfusion are not sufficiently definite.

Posthæmorrhagic anæmia is generally very well supported. It does not justify a transfusion if the general condition of the patient is satisfactory.

Secondary hæmorrhages, disturbances of the coagulability of the blood, absence of cell regeneration, and chronic infections leading to anæmia may give indications for transfusion.

*Preliminary precautions.* It is well to examine and classify donors in order to avoid transmission of diseases such as syphilis and malaria.

Fatal accidents have been observed in cases where the cells of the donor were agglutinated by the plasma of the receptor. Such fatal accidents are rare and may be obviated by an agglutination test, which can be made easily and rapidly. It is therefore necessary to test for agglutination in all cases where circumstances permit or to have the donors classed in groups.

In war conditions transfusion may be effected in the advanced posts and in the advanced hospitals. In the latter formations all the precautions can and should be taken. In advanced posts transfusion should be done, even if it is impossible to test for agglutination, the danger of severe accidents being relatively slight.

Transfusion must not be undertaken unless the conditions are perfectly satisfactory and strict asepsis can be assured.

*Technique.* The method must permit the measurement of the quantity of blood trans-

<sup>2</sup> Reports of previous Congresses were published in the INTERNATIONAL ABSTRACT OF SURGERY as follows: 1918, xxvi, 268, 461; xxvii, 10.

<sup>1</sup> Arch. de méd. et pharm. mil., Par., 1918, lxix, 570.



fused. Satisfactory means have been found by which blood preserved for several days can be used. This method will be of great service especially in advanced posts in case of intense military activity.

The indirect methods of blood transfusion are more easily applied than vascular anastomosis; the former depend on the employment of citrated blood; the latter on aspiration of pure blood into a paraffinated ampulla, or into syringes. All three methods give good results.

As a general rule transfusion should be done as early as possible after injury. Sometimes it cannot be employed until hæmorrhage is arrested. In cases of thoracic or abdominal hæmorrhage or of limb injury, transfusion is practiced before or during the operation, according to the condition of the patient.

#### TRENCH-FOOT

Trench-foot is a pathologic condition due to damp cold, often complicated by secondary infection. It has four stages occurring in the following order: (a) painful anæsthesia; (b) œdema; (c) formation of phlyctænæ; (d) cicatrization.

*Types.* Three clinical conditions may be described: (a) benign form (85 or 90 per cent of the cases) characterized by painful anæsthesia, œdema and redness; (b) a condition of medium severity (13 or 14 per cent of the cases) characterized by phlyctænæ and limited scars; (c) a severe form (about 1 per cent of the cases) characterized by extension of the gangrenous phenomena and by the appearance of septicæmia; this is the form which greatly mutilates or kills.

*Complications.* Trench-foot in the severe forms especially is very often complicated by tetanus and gaseous gangrene. It is subject to recurrence and relapse. Trench-foot occurs almost exclusively in soldiers who stay in the trenches, more particularly in certain trenches. Soldiers from warm countries, colored men especially, are more frequently attacked than Europeans. Youth, hyperidrosis, and a prior attack are favoring causes.

*Causes.* Blood stasis resulting from prolonged standing, long immobility, and a trying position (crouching); compression of the leg and difficulty of venous circulation produced particularly by puttees; and especially the long stay in the boggy, flooded trenches and shell holes are the principal causes of trench-foot.

*Diagnosis.* Trench-foot may be confused with true freezing and with chilblains. True frost-bite is characterized by early massive mortification

of a segment of the limb (forefoot, entire foot, etc.); trench-foot on the contrary has only a limited destruction, i. e., gangrenous areas on the back or the sole of the foot or on the toes, and progressively invades the tissues of the foot. The first type is seen in severe dry frosts, especially in mountainous regions; the second is only produced in humid weather in low altitudes. Trench-foot disappears with frosty weather. Chilblains, at least in the beginning of their evolution, are characterized by very great itching, while trench-foot, in those forms that might be confused with chilblains, is manifested by a painful anæsthesia without the least itching. It must be admitted that sometimes the diagnosis may be doubtful between ulcerated chilblains and the ulcerated phlyctænæ of trench-foot.

*Treatment.* The treatment of trench-foot is preventive and curative. Preventive treatment, energetically applied and supervised, causes it to disappear, or at least makes it rare. It comprises: (a) collective measures (sanitation and drying of the trenches and subsidiaries, and dry and warm shelters in which the men can gather when relieved); and (b) daily individual care (cleansing, greasing, and massaging of the feet; change of socks in the shelter; supervision of puttees and of anything else that may cause compression in the lower limb). The Belgians attribute the extreme rarity of cases of trench-foot in their army to the non-use of the puttee.

Curative treatment of trench-foot comprises: (a) for benign forms, every two or three days tepid foot baths and treatment of the foot with borated camphorated soap; and daily wrapping the foot in a large moist borated camphorated dressing; (b) for severe types, opening the phlyctænæ, touching them with camphorated ether, and applying a borated camphorated dressing.

If there are scars, carry out the same treatment patiently. Do not surgically remove the scars but only scarify them without causing bleeding in order that the modifying agents may act on the underlying tissues. Await spontaneous elimination, watch complications carefully and treat them surgically and fully from their beginning. Operation ought as a rule to be late, and should consist only of regularizing defective stumps from a functional viewpoint. Amputations should be reserved only for those cases where the seriousness of the general developments force the hand of the surgeon.

In all cases this treatment should be completed by a prophylactic antitetanic treatment which should be renewed every eight days until the wound cicatrizes.

#### PELVIC WOUNDS, PARTICULARLY OF THE BLADDER AND RECTUM

*Isolated pelvic wounds.* Treatment follows the general therapeutics of war wounds involving the soft and skeletal parts. Comminutive iliac fractures especially require a large trepanation. Removal of projectiles, since fragments are often projected into the psoas-iliac, is especially difficult and ought to be done as a routine.

*Bladder wounds.* (a) Intraperitoneal wounds are amenable to laparotomy and suture. (b) As regards extraperitoneal wounds, suprapubic wounds can be treated by primary vesical suture. Wounds of the lateral walls and base of the bladder which are inaccessible should be treated by an immediate cystostomy. The surgical treatment of the entrance wound and its trajectory assures sufficient drainage. Later the use of a retention catheter favors the closure of the urinary fistula.

Urgent primary cystostomy should be reserved for bladder wounds with retention or progressive or perivesical infiltration. Severe hæmaturia or the existence of an intravesical foreign body justifies an early cystostomy. Secondary infection of the bladder calls for cystostomy with drainage.

*Wounds of the rectum.* (a) Intraperitoneal wounds, like all intestinal wounds, are amenable to laparotomy with suture. (b) Extraperitoneal wounds, in the majority of cases, may be treated by exposure of the traumatized area, followed by tamponing of the rectal wounds.

Constipation of the patient is an indispensable aid. In a shattering injury with extensive destruction, the complete exposure of the rectum by a posterior rectotomy is the treatment of choice. Primary colostomy is only exceptionally indicated.

*Associated wounds of the bladder and rectum.* The majority of these cases recover following surgical treatment of the extravescical trajectory of the projectile. Colostomy should be reserved for cases with very extensive vesicorectal fistulæ. Primary cystostomy is often useless. The retention catheter, ventral decubitus, miction in the knee-chest position, all favor spontaneous cicatrization of the vesicorectal fistula.

#### TREATMENT OF PSEUDARTHROSES

The inevitable primordial cause of pseudarthroses in war fractures is the primary destruction of a part of the diaphysis. The other causes actually entering into line, infection, excessive surgical clearance, and bad reductions, ought not to occur.

A certain number of pseudarthroses can be avoided, thanks to sterilization of the fracture area, to a prudent surgical clearance, to good reduction supervised with care; and in certain well-determined cases, to immediate or early osteosynthesis.

In cases of resection of the lower extremity of the femur or upper extremity of the tibia or of these two bones, the treatment will be different according to the occupation of the patient. In the case of a workman, an attempt should be made to obtain ankylosis between the femur and tibia either directly or by means of a graft; if the occupation is sedentary, a pseudarthrosis fixed by an apparatus which allows flexion is more advantageous. One or another of these measures is preferable to amputation of the thigh, with an artificial leg.

In cases of extensive loss of substance of the lower extremity of the humerus, the elbow being intact, it is often desirable to obtain a pseudarthrosis permitting flexion between the humerus and its shattered lower extremity by leaving rotation to be produced in the radiohumeral articulation. This condition is more useful and durable than that given by an elbow resection. An additional method of combatting persistence of the infection consists in the employment of autogenous or stock vaccine.

With few exceptions pseudarthroses should only be done late, when the cutaneous wound is completely cicatrized and when inflammations appear clinically to have disappeared. The usual means at disposal (forced active and passive movements, rubber bands, forced massage, etc.) should reduce the remaining inflammation.

From the therapeutic point of view, two cases must be distinguished: (a) In simple pseudarthrosis and in certain pseudarthroses with loss of substance situated in segments of limb with only one bone, after freshening of the bone metallic osteosynthesis can be made. The best method appears to be fixation by a metallic plate with screws, the screws being placed as far as possible from the site of the pseudarthrosis. The combination of metallic prosthesis and osteoperiostic grafts have given very favorable results. (b) Pseudarthrosis with loss of bone substance very frequently necessitates bone or osteoperiostic grafts.

A perfect asepsis and complete excision of the fibrous tissue which surrounds fragments and certain diseased parts of the bone are necessary to success.



### CONSERVATIVE OPERATIONS IN WOUNDS OF THE FOOT

It being very desirable to preserve the integrity of the plantar sole, all incisions and resections in its vicinity must be limited to what is strictly necessary. Reunion by first intention should be sought in every case. The same course should be followed with the structure of the dorsum because cicatricial retraction may be detrimental to the functioning of the front of the foot. It is even permissible to resect certain bones of the foot in order to allow primary and secondary union of the wound and the normal maintenance of the plantar structures.

Amputation of one or more toes causes little disturbance. The preservation of a single toe, especially the first or the fifth, is often an inconvenience.

Metatarsal disarticulation, with preservation of the corresponding toes, generally gives unfavorable results. Resections of the first and fifth toes with their metatarsals generally result satisfactorily. Isolated preservation of the great toe with its metatarsal generally gives an unfavorable result. When the second, third, and fourth metatarsals are resected they give a tapering form to the foot, making walking and the erect position difficult. As a general rule the removal of three metatarsals notably upsets the balance of the foot.

Transmetatarsal amputation with a good plantar strip gives a very favorable result whether it is done in the anterior part or in the posterior part of the metatarsal. With the Lisfranc disarticulation walking is easy if the rest of the foot is in good shape. The difficulties of execution demand its simplification by leaving the metatarsal bases in the wound.

Prescaphoid-cuboid amputations give the best functional result. In a word, all anterior tarsal operations give favorable results if there is no complication due to the cicatrix or to the state of the neighboring articulations.

Chopart's amputation, when it is done under good conditions and well supervised, may give a good result; but equinism and overturning of the stump often give rise to functional disturbances which make this operation inferior to the Lisfranc or Syme amputation. A partial astragalocalcaneous resection or a horizontal calcaneous resection corrects the tendency to equinism.

Subastragalar amputation, Pirogoff's amputation, and especially that of Syme permit easy and rapid walking.

Posterior tarsal operations on the other hand are often followed by functional trouble. Total

or subtotal astragalectomy gives the best results; but these are less favorable than those obtained in time of peace; neighboring infections, articular and tendinous stiffness, insufficiency of supervision as regards the position of the foot after operation are the causes of this deficiency.

Resection of the calcaneum, either total or in its greatest extent, if it is not followed by osseous regeneration, leaves disturbances, very frequently with tibiotarsal or mediotarsal ankylosis. Partial resections, posterior or inferior, give more favorable results, if the foot is kept maintained at a right angle during the whole course of the treatment.

Associated resection of the calcaneum and astragalus generally give bad results.

*Atypical operations.* Resections of the anterior tarsus, scaphoid, and cuboid, are often accompanied with equinism with valgus, varus, or sinking of the arch. An orthopedic shoe greatly improves the functioning. Removal of one or the other of these two bones seems to have about the same degree of gravity.

The results of atypical operations involving several anterior tarsal bones depend upon the state of preservation of the arch of the foot, upon the value of the plantar supports, and the functioning of the articulations and tendons, rather than upon the locality of the operation itself.

Vicious attitudes of the foot, when the articulations are free, may be corrected or improved by sections or transplantations of tendons. The latter are especially useful in cases where certain tendons have disappeared.

Certain vicious attitudes with ankylosis will necessitate secondary skeletal operations (cuneiform resection or astragalectomy).

In general, conservative metatarsal operations are excellent; but on the posterior tarsus, resection of the calcaneum or combined resection of several bones often causes functional disturbances more severe than those consecutive to disarticulation or to a Syme amputation.

DePage mentions that in suppurations of the tarsal joints which persist in spite of astragalectomy, forcing of the foot frontward or inward by extensive section of the tendons and ligaments and maintaining this position by means of a bandage favors disinfection of the area. The foot can be replaced in its normal position after eight to fifteen days.

### OSTEOSYNTHESIS IN FRACTURES

Primary osteosynthesis must be distinguished from osteosynthesis in the infective period of the fracture. The possibility of applying either prim-

ary, early, or deferred suture to a large number of wounds complicated by fracture authorizes the practice of immediate osteosynthesis.

The indications for immediate osteosynthesis are rare: (1) certain articular fractures in which osteosynthesis would appear to be the method of choice for the re-establishment of the anatomical and functional state; (2) diaphyseal fractures which cannot be reduced or maintained in correct reduction (particularly supracondylar fractures of the femur, fracture of the forearm, etc.); the presence of large disorientated fragments. The perfection of modern apparatus permits a satisfactory correction without osteosynthesis in the majority of cases.

Primary osteosynthesis is a difficult operation which may give rise to great complications. It ought to be reserved for specialists, and at the present time its indications are rare. In the

British army it is not usual to resort to primary osteosynthesis for two reasons: (1) the good results which apparatus now is giving; and (2) the bad results which osteosynthesis has often given in the past.

#### OSTEOSYNTHESIS IN THE PERIOD OF INFECTION

In the period of infection, osteosynthesis is accepted by some and formally rejected by others. Those who accept it think that it diminishes infection in the neighborhood of the fracture, that it is not accompanied by prolonged osteomyelitis, and rarely gives rise to secondary sequestra. On the whole its results are favorable.

Its indications should be the impossibility of reducing certain diaphyseal limb fractures or of maintaining them in correct reduction.

Temporary osteosynthesis by plate and screws has more advocates.

W. A. BRENNAN.



# ABSTRACTS OF CURRENT LITERATURE

## GENERAL SURGERY—SURGICAL TECHNIQUE

### OPERATIVE SURGERY AND TECHNIQUE

**Wakeley, C. P. G.: Skin Grafting in the Treatment of War Burns.** *Lancet*, Lond., 1918, cxciv, 736.

Contractions with deformity are very distressing late complications of burns and occur whenever the whole thickness of the skin is destroyed. The author has used ambrine for over a year for burns of all degrees and has seen no marked improvement in healing properties or final results.

In extensive burns of the extremities Thiersch's method should be employed. The granulations must be clean and the area to be grafted must be entirely free from excessive granulations and as dry as possible. When the operation of skin grafting is completed, a wire cage is fitted over the grafted area and the patient is placed in sunshine as much as possible. Heliotherapy is especially valuable after skin grafting, for the rays of the sun stimulate the tissues and encourage absorption of pathologic exudates, especially scar tissue.

In some cases, particularly burns involving the face or neck, Thiersch grafts are apt to become overwhelmed by surrounding granulations and here Reverdin's method should be borne in mind, either as an alternative to incomplete success by Thiersch grafts or as a primary method of skin grafting.

In cases where the palm of the hand has been badly burnt and contractions are about to occur, Wolfe's method is the most suitable, the whole thickness of the skin being used as a graft, and secured to the raw area on the palm by interrupted sutures.

For all fourth degree burns of the extensor surfaces of the hands and wrists, where much contracture has developed or will take place, the plastic method of a flap from the abdomen should be employed.

The minimum amount of scar tissue is conducive to the best and most satisfactory results. To prevent scar tissue formation, it is the duty of the surgeon to consider skin grafting. V. C. HUNT.

**Handley, W. S., and Hanlon, P. J.: A Method for the Drainage of Deep Wounds of the Thigh.** *Lancet*, Lond., 1918, cxciv, 735.

Deep wounds of the thigh are more liable to be followed by gas gangrene and other grave forms of sepsis than are similar wounds of other portions of the limbs. Small deep wounds of this region are probably more dangerous than widely gaping ones.

The special gravity of thigh wounds probably

depends upon the enclosure of the soft parts in an inelastic sleeve of thick fascia lata. Inflammatory swelling confined beneath this fascia is apt to spread under high pressure widely and rapidly in the intermuscular planes.

The largest and most important space and the one most easily opened up is the space between the vastus externus muscle and the crureus. This space runs the full length of the thigh and communicates with many of the other intermuscular spaces. Anatomic conditions favor the drainage of this space by an incision which does not divide any important structure or subsequently impair in any way the function of the thigh. The incision is made along at least two-thirds of the length of the thigh and divides the fascia lata immediately behind the septum. The tissues are opened up in the plane between the external intermuscular septum and the hamstring muscles until the linea aspera is reached. The external intermuscular septum is now cut through along its line of attachment to the linea aspera and its prolongations above and below. Drainage tubes or Carrel's tubes are now inserted. The incision abolishes the constricting action exerted upon the deep tissues of the thigh by their tight sleeve of inextensible fascia.

The author presents a case in which the above method was used with good success, and advises its further use. V. C. HUNT.

### ASEPTIC AND ANTISEPTIC SURGERY

**Wilson, W. J.: The Phagocytic Response to the Introduction of Bacteria into Clean Wounds.** *Brit. M. J.*, 1918, i, 533.

The author has had an extensive experience with the bacterial flora of war wounds. He notes the small number of bacillus coli present when the wound tends to be clean. Even when wounds are on the buttock, where they are repeatedly contaminated with feces, the bacillus coli are few in number compared with the large number of enterococci.

He makes a few experiments on local immunity and finds that it is not so much the fluids of the wound that count for immunity against the bacillus coli as it is the phagocytosis. He observed a wound on the forearm just below the elbow-joint; smears showed no bacillus coli but many enterococci. Cultures of bacillus coli were made from the patient's feces, and on the third day 1 ccm. of a very thick emulsion of the growth was introduced into the wound and the effects studied at five minutes, one hour, two hours, six, twenty-four, and forty-

eight hours respectively. The early smears showed few leucocytes and many bacilli. In one hour the leucocytes increased and many bacilli were ingested. In six hours the majority of bacilli were intracellular. In twenty-four hours no bacilli were in smears but could be cultivated. In forty-eight hours cultures were negative.

Using antiseptics such as brilliant green, 1:1,000, retards the phagocytosis for a while; it is, however, assumed later, after the dye is absorbed by the skin. He questions whether the rapid bactericidal effect of chemical substances on free bacteria compensates for their inhibitory action on the leucocytes.

In another experiment he used dead cultures of bacillus coli and found that this greatly stimulates the production of leucocytes and phagocytes. For still other experiments he used streptococci and bacillus welchii vaccines with equally good results. He suggests autogenous vaccines used locally as a treatment for ulcers and sluggish wounds.

J. L. BUTSCH.

**Wright, A. E., Fleming, A., and Colebrook, L.: The Conditions Under Which the Sterilization of Wounds by Physiological Agency Can Be Obtained.** *Lancet*, Lond., 1918, cxciv, 831.

After extensive experimental and bacteriological work, the authors have drawn the following conclusions:

1. It has been erroneously inculcated that every wound should be sterilized before closure; and that therefore primary suture should be avoided and secondary suture undertaken only after a course of antiseptics. There is now no question, with respect to primary suture, that the wound taken after early surgical cleansing and resection is as good as sterile, and with respect to secondary suture, undertaken with a wound in good condition and a purely saprophytic infection, that such an operative procedure, provided it leaves behind no infected dead spaces, directly contributes to sterilization.

2. It has been taught that one should judge of the fitness of the wound for closure by necropycultures and direct microscopic examination of the pus. It would be infinitely more reasonable to base one's judgment upon the results of biopyocultures.

3. It has been taught that suture cannot be successful in a wound containing a hæmolytic streptococcus pyogenes. It has been seen that leucocytes can, given proper conditions, successfully combat this, and of course all other streptococci; and that these conditions can be realized in connection with the suture of wounds.

4. It has been taught that for the removal of sloughs from focal wounds chemical solvents are required. They have learned that sloughs can be removed by tryptic ferment set free from disintegrated leucocytes, and that the liberation of this ferment can be greatly accelerated by breaking down the leucocytes in the discharges with hyper-tonic saline solution.

5. Lastly, it has been taught in connection with

antiseptics that sterilization is obtainable only by continuous or very frequently repeated applications. They have learned that there is nothing to prevent any part of a wound surface which has been washed quite clear of albuminous matter being sterilized by a single application of antiseptics. E. C. ROOS.

**Lemaitre, R.: Report of 2,537 Cases of Primary Suture of War Wounds** (Apropos de 2,537 cas de sutures primitives pour plaies de guerre). *Lyon chirurg.*, 1918, xv, 65.

After trying various other methods, Lemaitre has been converted to the primary suture of war wounds whenever it is possible. In his present report he gives his experiences, technique, and results. Since July, 1915, he has treated 2,283 wounded men at the front, some with multiple wounds; there were altogether a total of 4,227 wounds; 323 of these were not treated surgically; 2,537 were sutured primarily; 209 were treated by delayed primary suture and 307 by secondary suture; 851 wounds were not sutured for various reasons.

The present report treats only of the 2,537 wounds primarily sutured. These were distributed as follows: wounds of the soft parts 2,030; wounds of the large joints, 87; wounds with complete diaphyseal fractures, 263; wounds of the hand and foot, 110; cranial wounds, 40; thoracic wounds, 7.

The time covered by this report is divided into two periods: the first, July, 1915, to July, 1917, in which wounds of all kinds were treated and in which primary suture was only tried in a limited number of cases; the second period, July to December, 1917, in which soft part wounds were principally the kind treated, but in which primary suture was done unless clearly contra-indicated. The results are shown in the following table:

	1st Period	2nd Period
Total number of wounds treated.....	2,336	1,891
Not treated surgically.....	216	107
Primary.....	1,046	1,491
Delayed primary or secondary suture..	306	210
Not sutured.....	768	83

The table shows that in the first period about 45 per cent of the wounds received were primarily sutured, and that in the second period this was increased to 79 per cent.

The method failed in only 0.84 per cent of the cases. There were but 4 deaths, 3 in cranial injuries and 1 thoracic case. The author considers that these figures speak eloquently in favor of primary suture of war wounds. All the cases were received within twenty-four hours after injury and in the great majority within seven to fifteen hours.

The author sketches the evolution which led to the adoption of primary suture, including a short trial of the Carrel method which owing perhaps to a faulty technique did not give him good results. He dwells in great detail on the steps prior to suture; the stripping and clearance of the wounded region; removal of contused tissue which must be neither



too sparing nor wasteful, careful hæmostasis complete by iodine fixation of the tissues, and finally, if the laboratory and clinical findings are not contra-indicative, the suture.

The surgical conditions must be such as to render absolute asepsis during operation. This applies to every detail of instrumentation, assistance, etc. The radioscopic, general, and local examinations must be detailed and complete. There are cases in which any muscle resection would be useless, and others invaded by gas gangrene where whole muscle masses must be removed. But there are signs which guide the amount of resection, viz., the normal color of the muscle mass; bleeding on the least cut; fibrillary contracture following excitation. The important point is that all dead tissue must be removed. Cutting a muscle across must be avoided if possible because in so doing nerves and vessels are cut which have dangerous consequences. Generally the amount of tissue resection is a matter for the experience of the surgeon.

After resection the tissues are thoroughly dried and treated with iodine tincture, 1:20; this prevents the formation of hæmatomata, and also destroys any surface microbes. There often results after this a slight serous exudate for which a small filiform drain of silk worm gut is left for three or four days.

According to the circumstances the surgeon may adopt either: (1) immediate primary suture; or (2) delayed primary suture in which after a few days the edges are brought together without any resection or edge freshening; or (3) secondary suture in which the wound is closed after resection of the cicatricial tissue. Whenever possible the author adopts immediate suture. Where this is not possible, the wound is subjected to clinical and bacteriologic control and the period of delayed primary suture depends on this. Wounds which cannot be primarily sutured have a simple dry dressing applied which is renewed every five or six days. Such wounds are found to suppurate very little or not at all. Disinfection of the wound is left to itself. The author's experience convinces him that wounds so treated arrive more quickly at the early secondary suture stage than if treated by the Carrel-Dakin method.

Contra-indications to immediate suture are spreading infection, gas gangrene, a bad general state, shock, shattered limbs, and an associated lesion of an important vessel. Slight fever does not prevent healing by first intention.

Nearly all the author's patients have joined their regiments after a period of hospitalization varying from fifteen days to two months.

In conclusion, the author says that there is no necessity to defend immediate primary suture; the results speak for it. Opponents of the method have charged that it requires a considerable amount of resection or at least greater than that necessitated in continuous irrigation by disinfectants. This is not the author's view. The amount in each case is the same. To do more than is necessary in either

case is to do too much. The method of immediate suture on account of its rationality, its facility, and accordance with the principles of sound surgery have made it now classical in the treatment of war wounds and to oppose it is to be unjustly prejudiced.

W. A. BRENNAN.

**Chalier, A.: Late Suture of War Wounds** (Les suture tardives des plaies de guerre). *Bull. et mém. Soc. de chir. de Par.*, 1918, xlv, 657.

By late suture Chalier means wounds primarily operated upon and immediately sutured after a lapse of thirty-five or forty hours or even of several days after the occurrence of the lesion. It is quite distinct from delayed primary suture in which the primary operation is done soon after injury, the wound left open and sutured when the aseptic condition is manifest. This latter is the ideal condition when the surgeon has a bacteriological laboratory at his disposal, yet a good deal of war surgery has to be done without this aid. The clinical aspect of the wound and its surrounding tissues, the temperature, general state, etc., will often tell whether a wound is strongly infected or not; and if the infection is not marked, such wounds can often be sutured provided they can be well supervised, as was the case in those reported by Chalier. In his 32 late sutured wounds, in three cases it was necessary to reopen them. In all the others the results were just as good as in cases of early primary suture. These were not slight wounds. In 5 there were bone lesions, and 17 had included projectiles.

The point is generally neglected that between early primary suture and secondary suture of old wounds, surgically, chemically, or spontaneously disinfected, there is a time for late primary suture applicable in cases where the wound is only slightly septic.

In the discussion Potherat, Delbet, Tuffier, and Faure added their testimony to that of Chalier, citing many cases in their ambulance service where late primary suture was carried out with success. It cannot be concluded that suture can always be effected, or that one can temporize in evacuation of the wounded. But it can be said that the time limit for primary suture already laid down can be extended and that in certain conditions of benign wounds, especially bullet wounds, immediate, delayed or retarded primary suture may be attempted.

W. A. BRENNAN.

## ANÆSTHETICS

**Chaput and Schekter: Extensive Gangrene of the Skin Following Regional Anæsthesia with Weak Novocaine-Adrenalin Solution** (Vaste gangrène cutanée, consécutive à une anesthésie régionale à la novocaïne-adrénaline en solution faible). *Bull. et mém. Soc. de chir. de Par.*, 1918, xlv, 808.

The patient was a woman sixty-seven years old, with an old crural hernia. Regional anæsthesia was

effected with a 1:400 novocaine solution, to which 20 drops of 1:1,000 adrenalin were added for every 100 ccm. of novocaine. A week later there was a rise in temperature and a cutaneous area of about five finger-widths was infected. This suppurated abundantly and showed sloughs.

The area was excised and dressed and an autoplasmic repair operation done a little later. Two and one-half months later the patient was quite recovered.

The author states that adrenalin is known to cause ischæmia and gangrene, and although rare, some authors have reported cases of gangrene consecutive

to subcutaneous injections of adrenalin. A depleted general state and arteriosclerosis are among the favorable factors for the development of gangrene. The authors will discontinue the addition of adrenalin in solutions for local anæsthesia.

In the discussion Legueu said that he had been accustomed in his prostatic operations to use local anæsthesia, including 20 drops of adrenalin. With this mixture he had observed much gangrene of the cellular tissue of the hypogastric region; but since he has reduced the proportion of adrenalin to 5 drops per 100 grams of solution, he has had a disappearance of the gangrene. W. A. BRENNAN.

## SURGERY OF THE HEAD AND NECK

### HEAD

**Ombredanne, L.: Facial Autoplastics** (Autoplasies faciales). *Bull. et mém. Soc. de chir. de Par.*, 1918, xlv, 592.

Ombredanne's experience with facial plastic surgery has confirmed the broad lines for technique laid down more than fifteen years ago by Nélaton. For secondary plastic operations a general anæsthetic is necessary. If the lesion occupies the upper part of the face, ether is used; if the lower portion is involved, chloroform inhalation is employed according to American methods. Before the operation the cutaneous incisions limiting the strips to be used are traced out in color on the face, and paper patterns of the strips as proposed are cut and tried on the face to see that they fit properly. For reinforced strips and to obtain rigidity the author uses costal cartilage.

Ombredanne confirms Nélaton's teaching that the Italian method gives the best results in nasal plastics; but he has made some modifications in earlier methods. For instance, in filling a gap about the mouth or cheek he uses a thick strip cut near its site which is doubled over, the bleeding surface being turned outside. This is covered with a skin strip according to the Italian method cut from the arm or some other facial region. He gives a number of examples showing the use of the covered-over doubled strip.

Ombredanne describes a number of models specially constructed to facilitate correct cicatrization of facial autoplastics. Such models are mostly made of tin; this substance is better tolerated than silver or vulcanite. W. A. BRENNAN.

**Todd, T. W.: Injuries to the Malar Bone and Zygoma.** *Ann. Surg.*, Phila., 1918, lxvii, 403.

Damage to the cheek results in local extravasation and in swelling which obscure the actual condition of the bones. The author finds in a careful examination of the skulls of Europeans and American negroes that 38 out of a combined total of 467 individuals had suffered pathological deformation

resulting from blows upon the cheek. No light is thrown by the examination upon the age at which the injury occurred, as all the lesions were healed.

The injuries to the zygomatic arch are much more common than injuries to the malar itself. Of this type two degrees may be described,—depression and fracture-dislocation. Contrary to the usual impression, fracture or fracture-dislocation of the malar bone occurs alone or with extension only to the maxilla more frequently than as a part of a widespread lesion. The force of moderate blows is effectively absorbed by the resilience of the facial skeleton. "Spent" blows are not represented in the malar series and the author has no specimen showing only slight damage in the malar type of fracture.

The failure to appreciate these injuries is due to the fact that the majority never come under clinical observation. Interference with the action of the masticatory muscles is usually temporary and affection of the infra-orbital nerve results in no pronounced symptoms. Involvement of the temporomandibular joint, permanent blindness, and other grave conditions result from much more severe injuries than those necessary to produce the fractures of the zygoma or malar bones. GATEWOOD.

**Behan, R. J.: Loose Cartilage in the Temporomaxillary Joint.** *Ann. Surg.*, Phila., 1918, lxvii, 536.

The author reports a case in which he made the above diagnosis. The patient's chief complaint was inability to close the mouth so that the teeth would come together, causing great difficulty in masticating food. The condition followed a difficult effort at mastication eight months previously. The jaw became locked, but the patient was at first able to release it; finally the locking became permanent.

The author was convinced that the locking was due to a separation of the left interarticular cartilage with a forcing back of the cartilage into the temporomaxillary articulating cavity. He devised the following operation, after a search of the literature failed to disclose an operation for the correction of such a deformity:



1. An incision along the auricle and down to the pinna is made.

2. The skin and subjacent tissues are dissected back toward the face. Care must be taken not to injure the superficial branches of the temporal, which in many cases are given off immediately above the zygomatic process.

3. If the branches of the temporal artery are given off at a higher level than the malar, a transverse incision is made along the zygomatic process beginning about 1 cm. anterior to the auricle.

4. The anterior margin of the parotid is then defined and a perpendicular incision is carried down for a little over 1 cm. along its anterior edge, care being taken to avoid Stenson's duct. The parotid is dissected downward. The posterior margin of the masseter is exposed and drawn forward. If the second incision has been a perpendicular one, the third incision is transverse, slightly above the line of articulation.

5. The patient's mouth is now opened and the condyloid process is thrown forward.

6. The capsular ligament is incised transversely close to the margin of the articular cavity, and the cavity of the joint is opened.

7. Blunt pointed forceps are now introduced into the joint cavity to determine if it is entirely free.

8. If the cartilage has been torn free at its anterior end, it is found back in the joint cavity. The anterior edge of the cartilage is caught and drawn forward and is sutured to the periosteal margin of the articular cavity.

9. If the posterior ligament is torn, it is sutured to its respective margin by silk sutures, care being taken that the silk does not enter the joint cavity. An incision directly on the surface of the condyle opens the cavity between the cartilage and the articulating surface of the inferior maxilla.

10. After the interarticular cartilage has been sutured in place, the capsule is closed by a catgut suture, as are also the fascial incisions. The skin is closed by either catgut or horsehair.

The author shows several cuts and drawings illustrating the various steps of his operation.

E. C. Roos.

**D'Este, S.: Contribution to the Cranial and Cerebrocranial Surgery of War** (Contributo alla chirurgia cranica e cranio-cerebrale di guerra). *Clin. chir.*, Milano, 1917, xxv, 225.

The author gives the results of his experience with 87 cases treated by him in the period from July, 1915, to November, 1916. From the clinical standpoint the author insists that all cranial wounds call for careful examination, especially those apparently slight cases in which symptomatology is either significant or almost absent. There is obviously no discussion in regard to serious cases. Clinically, on account of surroundings, expediency, and other exigencies, the surgeon cannot and should not await the appearance of

positive symptoms which may be tardy or may not appear at all. Meantime there may be a silent aggravation of existing injuries or septic processes may have time to become fully developed.

Consequently the first action called for as a routine measure is the surgical exploration of the injured cranial zone, as experience has demonstrated that in such cases a direct examination of the exposed cranium is better than any other method, even radiologic examination, to gather the necessary diagnostic data for the surgeon to decide upon the operative procedure required. Further, in addition to its diagnostic value, this exploration creates the best conditions for subsequent treatment of the wounds of the soft epicranial parts.

In view of the double advantage referred to, the author gives reasons for preferring the semi-circular incision in the scalp. With regard to intervention, the author criticizes as pernicious and erroneous the tendency of some surgeons who have translated the need for immediate treatment of cranial lesions into a universal indication for craniotomy. When trepanation is unquestionably indicated, the operation should be adequate. By this is meant that while the cranial breach should be the smallest that is necessary, the operation must be such as to afford the surgeon a clear and complete view of the endocranial lesions.

The chief aim in cranial operations should be: the most scrupulous cleansing of the interior traumatized area from the cuticle to the brain; evacuation of hæmatomata and establishment of hæmostasis; removal of bone splinters which have sunk in, whether embedded in the meninges or not; treatment of abscesses, etc. With regard to projectiles, the author is of the opinion that their extraction should be a routine measure except in special cases, as for instance, where a projectile is inaccessible owing to its deep situation or to a special position from which its removal might endanger the patient's life.

In order to reduce the complications of trepanation to a minimum, the author advises that splinters, especially if large, which have sunk in but are still adherent to the theca should be left; but that those which have sunk in but are detached should be used as plastic material, being immediately fixed in position and secured with wire, silk, or catgut sutures to the epicranium.

The author has himself always followed this procedure with excellent results. In the 87 cases, surgical exploration of the cranium was negative in 14 cases. In 72 cases cranial resection was done. There were 6 deaths, 2 being due to late complications. The other 4 deaths were due to the nature and extent of the lesions, which operation could not remedy.

W. A. BRENNAN

**Harrigan, A. H.: Sarcoma of the Corpus Callosum.** *N. Y. M. J.*, 1918, cviii, 1217.

In this case of sarcoma of the corpus callosum the diagnosis, which was proved at autopsy to be



correct, was made on the following findings: a history of injuries to the head; convulsions; severe intermittent headaches with vomiting; weakness of the right leg and staggering to the right when walking; failing memory; hallucinations of taste; delusions (thought poison was in the food); slow pulse; Cheyne-Stokes respiration; urinary retention; twitchings and later paralysis of the right hand; positive Bárány test on the right; and choked disc.

At operation a large osteoplastic flap was turned down, after much difficulty in cutting the thickened bone. The brain did not pulsate. After the vessels had been tied with silk, a dural flap was fashioned with base opposite to the bone flap. Exploration of the surface of the brain with the ball of the finger was negative. The brain was punctured in four places with a hollow needle without result.

Death occurred sixteen hours later and the autopsy findings revealed a mixed-cell sarcoma in the white matter of the left hemisphere beneath the cortex of the rolandic area down into the corpus callosum and backward into the occipital lobe. The author concludes that in a similar case a primary decompression would probably best meet the indications, leaving more radical measures for subsequent occasion.

P. W. SWEET.

**Cortesi, A., and Bonola, F.: Displacements of Foreign Bodies in the Cerebrospinal Axis** (Sugli spostamenti dei corpi estranei nell'asse cerebrospinale). *Riforma med.*, Napoli, 1918, xxxiv, 365.

The authors refer to foreign bodies, bullets, particles of shell, etc., reaching inaccessible portions of the cranium or spinal column. Such foreign bodies if lodged in soft tissues can become displaced and spontaneously reach a point from whence they may be extracted. The point to which the authors pay particular attention is that such spontaneous displacements are always along a path in which the nerve tissue of the brain or cord has been softened and modified by inflammatory processes. The path of this inflammatory process is usually the trajectory of the projectile and the action of gravity on the latter favors its displacement along this altered path if the position of the patient so permits.

Such spontaneous displacements have been observed by the authors and they have been able to reach and extract foreign bodies previously unattainable in the brain and spinal column. But a displacement of such foreign bodies may also be effected after a craniotomy or laminectomy. In order to render accessible slight projectiles in deep cranial wounds such wounds should be lightly packed with sterile gauze. The brain does not tolerate ordinary drainage tubes. After taking the necessary radiographs for the exact localization of the foreign body, the patient ought to be put in decubitus until the time of definite operation for the foreign body, and always on the side that favors displacement by gravity of the foreign body toward the point which it is to reach.

W. A. BRENNAN.

**Sharpe, W.: Diagnosis and Treatment of Brain Injuries with or Without Fracture of the Skull.** *Am. J. Surg.*, 1918, xxxii, 109.

Sharpe states that after a patient has developed profound unconsciousness, definite paralysis, lowered pulse-rate and Cheyne-Stokes respiration and pulse, the recovery of the patient is very doubtful whether operation is done or not, the mortality being 50 per cent or higher. However, this stage of extreme medullary compression should be anticipated, if possible, by determining as early as possible whether or not there is present an increase of the intracranial pressure. The two most important methods for determining this increase of intracranial pressure being the ophthalmoscopic examination of the fundi of the eye and the measurement of the pressure cerebrospinal fluid at lumbar puncture by means of the spinal mercurial manometer.

Of the 239 adult patients having brain injuries treated in three years, only about 34 per cent or practically one-third the total number showed an increased intracranial pressure; that is, two-thirds of the patients required no operation, as the intracranial pressure was not markedly increased and the expectant palliative treatment sufficed.

If an operation is advised, then not only is it necessary to determine the type of cranial operation to be performed, but also the ideal time for the operation.

These factors have made it possible to lower the mortality of fracture of the skull from 50 per cent, the average in most hospitals, to 30 per cent at the Polyclinic Hospital.

The presence or absence of an increased intracranial pressure is ascertained most accurately by the measurement of the cerebral spinal fluid at lumbar puncture by means of the special mercurial manometer. This is similar to a blood-pressure apparatus and by it the varying degrees of intracranial pressure can be carefully recorded. By this method it is not necessary for the patient to reach the stage of papilloedema and choked discs, the pulse rate to descend to 60 and below, and the respiration and pulse to assume the irregular Cheyne-Stokes character of medullary compression before the presence of increased intracranial pressure can be accurately ascertained.

The most important question in the treatment of brain injuries with or without a fracture of the skull is, "If an operation is advised, when should it be performed?" The answer to this may be more clearly understood by first stating the two times when the operation should not be performed. There is, first, the condition of severe shock with a pulse-rate of over 120, and secondly, the condition of medullary oedema and collapse, the death knell of the patient. If these two extremes can be avoided, then all operations should depend upon the presence or not of a definite increase of the intracranial pressure whether there is a fracture of the skull or not.

If a high intracranial pressure is indicated by the



ophthalmoscopic examination, and by the measurement of the pressure of the cerebral spinal fluid at lumbar puncture, then a cranial operation is advisable to relieve this intracranial pressure, both by enlarging the intracranial capacity and by the drainage of possible hæmorrhage and cerebral spinal fluid. The operation of choice to relieve the increased intracranial pressure is the subtemporal decompression and drainage.

If by this first operation the drainage of blood and cerebral spinal fluid is slight and still the intracranial pressure remains high, then it may be necessary to perform a similar operation upon the opposite side of the head. The operating convalescence of these patients usually requires two weeks. However, they should not be allowed to enter into their former active life for a period of three months or longer.

The treatment of brain injuries should not be limited merely to the recovery of the patient as far as life is concerned, but it should also be directed toward obtaining a normal individual, approximating as closely as possible the condition of the patient before the injury. K. S. GARDNER.

**Espejo, G. E.: Traumatic Cerebral Œdema Causing Late Signs of Focal Cortical Irritation; Report of a Case.** *J. Am. M. Ass.*, 1918, lxx, 1278.

The patient in the case reported developed signs of focal irritation of the cerebrum six days after injury. These included spasmodic contractions of the left half of the face and neck, a complete flaccid paralysis of the left arm and leg, fixed wide-open eyes, dilated pupils, and complete unconsciousness. X-ray examination had revealed linear fractures of the right parietal and frontal bones, also a fracture through the petrous portion of the temporal bone.

An exploratory decompression (subtemporal) was made. No depressed fracture was found, no evidence of hæmorrhage, and there was no general increase in the intracranial pressure, but rather a focalized cortical œdema, possibly due to the cortical contusion. The cortex was œdematous and grayish, and the cortical vessels were dilated and tortuous. The patient was discharged well twelve days after operation.

The author states that this case illustrates that the late signs of paralysis and convulsions coming on after traumatism to the head could have been produced by the same causes, irrespective of the presence of a fracture, and that therefore late signs of focal irritation should be watched for. All these injuries, he states, are serious, as considerable damage to the brain substance or its membranes may be produced, and many patients who recover from the immediate effects of the injury may later develop headaches, epilepsy, or dementias.

In view of the signs and symptoms that were present in this patient, and their subsequent development requiring an immediate operation,

it makes it imperative that patients in whom, from the history or from signs present on examination, a brain injury is suspected to have occurred, should have a lumbar puncture performed and repeated ophthalmoscopic examinations made. Should there be no marked increase in the intracranial pressure nor localized signs of cortical impairment, then the expectant palliative treatment should be instituted, and if in shock, naturally no operation should be performed until the patient has reacted from it.

The prognosis in this class of patients is regarded as most uncertain, and they must always be carefully watched and examined for fear of immediate and future complications. If these patients are watched carefully and operated upon promptly when symptoms justify operative intervention, the prognosis is excellent. E. C. ROOS.

**Chiasserini, A.: Experimental Hypophyseal Lesions** (Lesioni sperimentali dell' ipofisi). *Pol. clin.*, Roma, 1918, xxv, sez. chir., 97.

The author by bilateral temporoparietal craniectomy exposed the hypophysis in dogs and injected in it or its immediate vicinity pathogenic substances. He found that by inoculating sporotrichia and tubercle bacilli in the sella turcica or in the hypophysis he obtained variable modifications in the special structures or the glandular parts of the hypophysis. On the one hand there were regressive inflammatory modifications which progressed by degrees until a complete substitution of the hypophysis by inflammatory tissues resulted; on the other hand there were hyperplastic changes mostly involving the pars intermedia but in one case very evident in the pars anterior. The first were observed when the inoculation was made either directly in the hypophysis or in the sella turcica, the hypophysis being previously mechanically injured; the second type was seen by inoculating the sella without a previous lesion of the hypophysis. To anatomic lesions limited to reduction or total replacement of the glandular parenchyma there corresponds a syndrome of cachexia, or hypophyseal asthenia. This syndrome may also be observed, even if a notable part of the glandular lobe is preserved, when the flow of the glandular secretion into the circulation is prevented or rendered very difficult by detachment of the pedicle, by the presence of hæmorrhagic foci, or by stasis.

To hyperplastic changes in the pars intermedia corresponds a syndrome of polyuria which is sometimes very notable. Thickening of the skin and osseous changes resembling the picture of acromegaly correspond to changes in the pars anterior.

The syndrome of hypophyseal cachexia or asthenia begins after some days and progresses rapidly. When the hypophyseal deficit is acute, death occurs rather suddenly after from two to six days.

Increase of the volume of the hypophysis to two or three times its normal size or its substitution by inflammatory swellings does not seem to cause

special symptoms. In some cases local symptoms were observed, such as disturbance of vision. Usually perihypophyseal infiltration is superficial; when it is deep, lesions are observed in the walls of the third ventricle, but these do not cause immediate death.

The conclusions drawn by the author are:

1. Detachment of the hypophyseal pedicle and massive hæmorrhages which dissociate the glandular parenchyma are fatal usually after a short period.

2. Inoculation of sporotrichia or of the Koch bacillus in the sella turcica without any previous lesion of the hypophysis frequently causes progressive changes in the pars intermedia and sometimes in the pars anterior. To such correspond marked polyuria and some symptoms interpreted as acromegalic.

3. The same inoculation, when there is a previous lesion of the hypophysis or direct hypophyseal inoculation, usually causes inflammatory and degenerative lesions, which by degrees cause complete destruction of the gland, and to which a syndrome of hypophyseal asthenia or cachexia corresponds.

4. Sellar tumefactions of medium grade do not appear to be capable of causing any special symptoms.

W. A. BRENNAN.

## NECK

**Pfender, C. A.: Tuberculous Lymphatic Glands of the Neck Treated by Roentgenotherapy.** *Med. & Surg.*, 1918, ii, 400.

The author gives a brief description of the technique employed. He cites the results obtained and opinions held by numerous authorities, as disclosed by the literature. Condensed histories of ten selected cases of his own are included. He reaches the following conclusions:

1. Roentgenotherapy offers the best results of all the remedial measures now known for the treatment of acute, subacute, and chronic forms of tuberculous cervical glands, both hyperplastic and suppurative.

2. Simple hyperplastic tuberculous glands of the neck should not be treated surgically until roentgenization has been tried. Only when the latter fails is an operation to be considered.

3. Suppurative tuberculous cervical adenitis is best treated by simple incision or evacuation by aspiration preceded and followed by roentgenization.

4. Suppurative glands with discharging sinuses give the highest percentage of cures when treated by surgical drainage combined with roentgenotherapy. Repeatedly operated sinuses with failure to cure yield promptly to roentgenization.

5. The conservative treatment of tuberculous cervical glands comprises medicinal, dietetic, heliotherapeutic, and roentgenotherapeutic measures and is followed by ideal results. Surgical measures are merely auxiliary aids in selected cases.

6. Extensive dissection with excision of tuberculous cervical glands is now rarely, if ever, justified.

7. Contra-indications to roentgenotherapy do not exist. Local and general improvement of the patient follows proper roentgenization in all varieties of tuberculous glands of the neck.

ADOLPH HARTUNG.

**Pember, J. F., and Nuzum, T. W.: Differential Diagnosis of Forms of Goiter.** *Wisconsin M. J.*, 1918, xvi, 392.

Pember and Nuzum, after discussing in detail the pathology and differential diagnosis of the various types of goiter, conclude as follows: There is a growing tendency to disregard the old classifications of goiter and to consider the subject of goiter as a co-related whole. The pathology found in these enlarged glands appears in many cases to be secondary to infection or to some profound disturbance of the nervous system which calls for increased thyroid output; this in turn produces changes in the sympathetic nervous system, adrenals, and other organs of the body. The combined effect makes up the picture of exophthalmic goiter, with varying degrees of hyperthyroidism.

The differential diagnosis is not difficult if careful study is made of each case. The greatest difficulty arises in the border-line cases of thyrotoxic goiter which are often confused with enlargement of the thyroid due to infections or to such diseases as incipient tuberculosis or neurasthenia.

ALBERT EHRENFRIED.

**Smith, E. V.: Surgical Versus Medical Treatment of Goiter.** *Wisconsin M. J.*, 1918, xvi, 388.

Smith classifies goiters in three groups, i. e., exophthalmic, toxic adenomatous, and colloid. In exophthalmic goiter, the treatment should be primarily medical. Every means should be employed before resorting to surgical treatment. Among these are absolute rest, an ice bag over the heart, and a diet which is as nearly protein-free as possible, with an abundance of carbohydrates. Everything possible should be done to inhibit the over-active metabolism occurring in these patients. Hyperthyroidism in many cases is self-limited. Cases may exist for a number of years and gradually improve.

Ligation of the superior thyroid arteries is valuable in extreme cases as a means of preparing the patient for the more radical operation of resection. Patients at the height of an attack of hyperthyroidism should be treated by non-operative measures until the severity of the intoxication has begun to subside. Of all types of surgical cases, Crile's anoci-association principles are the most valuable in exophthalmic goiter. From a review of all the data obtainable on operative cure, recovery can be expected in about half the cases, and one-half the remaining number will be benefited.

In the toxic adenomatous group there may be two types of symptoms, those due to chronic poisoning, and those due to pressure. When the latter symptom is present the patient should be given relief by removal of the pressure. In cases where the results



of chronic intoxication exist, one has many factors to consider before advising the removal of the gland. Often it is advisable to reduce the blood-pressure and rest the heart for a period of three weeks or more before attempting an operative procedure. In no type of case does pre-operative treatment produce such gratifying results as in toxic adenomatous goiter.

With colloid goiters, medical measures often produce wonderful results. The simple colloid goiter which frequently develops at puberty in many instances responds rapidly to external or

internal medication with some form of the iodides. Many disappear before the adult age if nothing is done. The true colloid goiter seldom causes pressure symptoms unless complicated with adenomata. But it may cause so much disfigurement that for cosmetic reasons alone an operation is advisable.

There can be no doubt that the thyroid gland plays an important rôle in both the mental and physical development of the individual during adolescence. There should be less surgery and more non-operative treatment used in the care of these patients.

ALBERT EHRENFRIED.

## SURGERY OF THE CHEST

### CHEST WALL AND BREAST

**Smith, A. H. D.:** Intermittent Hæmatemesis Following on an Injury to the Chest. *Brit. M. J.*, 1918, i, 533.

The patient, a soldier aged thirty-nine, had always enjoyed good health, and gave no specific history. For many years he was a heavy spirit drinker; however, he had totally abstained during the past three years. Several days before presenting himself, while walking up a slope against a very strong wind, he found difficulty in breathing and blood suddenly rushed to his mouth. The same thing happened a few days later while walking up a hill; this time the blood was clotted. He was short of breath for some time after the attack, but was able to walk four miles home and carry on his work.

Two years earlier he was kicked in the precordial region by a horse. No ribs were broken. He was strapped for eight weeks following and attended the hospital as an outpatient during this time. There was no vomiting or spitting of blood; the only symptom was pain.

Physical examination was negative except for a tender liver and a less tender spleen. The condition is probably secondary, and is one of varicosities of the veins at the lower end of the œsophagus. These veins may have been injured by the trauma to the chest, and so an extra strain has been thrown on veins already weakened by cirrhosis of the liver and spleen.

J. L. BUTSCH.

**Chapin, H. D.:** A Comparison Between Clinical and Roentgen Findings in Diseases of the Chest. *J. Am. M. Ass.*, 1918, lxx, 1357.

The object of this study was to find out how much could be learned from roentgenograms and how the latter can fortify or throw doubt on the diagnosis made from physical examination. Fifteen cardiac and 97 pulmonary cases were studied.

In the heart cases 7 showed practical agreement, one partly agreed, and 7 failed to correspond in the conclusions reached by these two methods of examination.

In the lung cases 77 out of the 97 showed a sub-

stantial agreement. There was disagreement in 20 of the cases. Of the latter, 5 gave roentgenographic evidence of lobar pneumonia that was not detected by physical signs. Two gave physical signs of lobar pneumonia that were not confirmed by the roentgen ray. Three showed physical signs of bronchopneumonia not exhibited by the roentgen ray. Two failed to show the presence of fluid in the pleural cavity by physical signs when it was exhibited by the roentgen ray.

As a rule, the roentgen ray gave a showing in the absence of physical signs in congestions, small consolidations, hilum infiltrations, interlobar pleurisy, miliary tuberculosis, and mediastinal tumors. The roentgen ray may be very helpful in these conditions when the physical signs are insufficient for a diagnosis.

Auscultatory physical signs are of course not so apt to be accompanied by roentgen ray shadows as are the percussion signs.

J. L. BUTSCH.

**Saviozzi, V.:** Penetrating Thorax Wounds (Sulle ferite penetrante del torace). *Polidlin.*, Roma, 1918, xxv, sez. prat., 441.

The author treated 137 thoracic wounds, consisting of a first series of 28 in 1915, and a second series of 109 more recently. There were 41 deaths. Hæmothorax was observed in 60 per cent of the first series and in 66.88 per cent of the second series. Hæmoptysis was associated with hæmothorax in 25.64 per cent and was the most frequent cause of death.

It has been asserted by some that in hæmothorax due to lesions of the vessels of the thoracic wall, the internal mammary or one of its branches is involved; while the intercostal artery is habitually protected by the lower costal margin. Saviozzi has been able to disprove this by the results of 27 autopsies. He has never found a hæmothorax due to the lesion of the internal mammary, but there were very many due to injury of an intercostal artery. The autopsies showed 15 cases of hæmothorax of parietal origin and 8 of pulmonary origin. Five cases of bilateral hæmothorax were noted.

Regarding coagulability of the blood of hæmo-

thorax, the author's autopsies have shown that blood in the pleura was never found coagulated when the hæmothorax was due to a lesion of a vessel of the thoracic wall; on the contrary, it was constantly found coagulated when the hæmothorax was consecutive to a pulmonary lesion.

Hæmoptysis was observed 31 times in 106 cases. In 24 it was associated with hæmothorax. Subcutaneous emphysema was observed altogether 19 times. It was localized in 18 cases and general in 1. This symptom indicates not only penetration but involvement of the pulmonary tissue. Local emphysema generally disappears after a few days. In the author's cases this symptom when present was always accompanied by penetration. It may be affirmed that emphysema can be produced by a simple lesion of the pleural parietes if there is pneumothorax.

Empyema was observed in 9 cases and was treated by thoracotomy. There were 7 recoveries and 2 deaths. Pericardial injuries with resulting fibrinous pericarditis was observed 3 times. In treatment the author recommends absolute rest with morphine, etc. Thoracentesis is dangerous during the first week because it may provoke a fresh hæmorrhage. When it is indicated, not more than 500 ccm. of blood should be withdrawn at one time.

The surgeon should use his judgment as regards ligating the intercostal artery when it is believed that hæmothorax is of parietal origin.

Although the author has not had the means of practicing it, his findings in numerous autopsies induce him to think that the Forlanini method is applicable when hæmothorax is due to a lesion of the intercostal artery.

W. A. BRENNAN.

**Broadbent, W.: Interlobar Empyema and Other Surgical Complications of the Thorax.** *Brit. M. J.*, 1918, i, 529.

The author mentions the comparative ease of diagnosing empyema of the ordinary kind following a pneumonia, with the hectic temperature, silence at the base of the lung, heart displacement, etc. Empyema is not always so easy to diagnose; he has found it to occur with no history of pneumonia. Children have come under his care with the chest half full of pus who have never been ill in bed.

These cases of empyema undiagnosed or difficult to diagnose are usually interlobar. Lung abscesses and right or left subphrenic abscesses with chest signs complicate the diagnosis. When much pus collects in an interlobar fissure, the lower lobe of the lung is so compressed that it becomes dull and airless, leading to the belief that it is an ordinary empyema until exploration in the usual areas finds no pus. Such an interlobar empyema may at times leak down some pus over the lower lobe, which is discovered by the needle in the usual areas. Operation relieves the local collection of pus but fails to find the larger interlobar pocket, which has to be drained at a later operation.

The author speaks of an interlobar area, a very dull band either in the second or third space in front or just below the spine of the scapula behind. As a rule there is much diminished resonance over the lower part of the chest, but not the flat dullness of the band of fluid, and the breath sounds are very weak and usually absent at the base.

The best place to insert a needle is the second or third space in the anterior axillary region, with the arm extended above the head.

J. L. BUTSCH.

**Le Fort, R.: A Study of Projectiles Buried in the Mediastinum** (Contribution à l'étude des projectiles inclus dans le médiastin). *Rev. de chir.*, Par., 1917, liii, 495.

Le Fort's extensive study of mediastinal wounds with an arrested projectile has been brought to a close by the detailed case reports of 37 observations on which it is founded. Many of the cases are illustrated. These cases only include those in which a projectile is embedded in the mediastinal region without any persistent fistula, and were observed and followed in the base or interior hospitals.

The study includes the following chapters: (1) pathologic anatomy; (2) nature of the lesion; (3) symptomatology; (4) evolution of the injury; (5) treatment; (6) technique of operative procedures: (a) by anterior routes; transpleural, extrapleural, or transcostal; (b) by posterior routes; transpleural or extrapleural; (7) results, including the postoperative course.

In concluding and summarizing his study Le Fort says that the prognosis in regard to projectiles left in the mediastinum is not definitely fixed. The pathologic findings suggest that certain projectiles can be left for a long period, if not permanently without causing death. Severe complications are on the whole rare. However, the majority of the wounded with a mediastinal projectile have periods of pain, especially dyspnoea on effort, which render them unfitted for work.

Up to the present, operative intervention has rather been avoided on account of its apparent gravity. The newer ideas regarding the search for and localization of mediastinal projectiles, the normal and pathologic physiology of the region, the surgical methods applicable, and their results show operation to be effective and relatively benign.

The extraction of large foreign bodies, either dangerous or badly tolerated, should only be undertaken by an experienced surgeon having at his disposal all the means necessary to bring one of the most delicate surgical operations to a successful issue. Any operation on the mediastinum ought to be preceded by a very complete radiologic examination made by the surgeon and radiologist acting in collaboration. This radiologic examination will give a number of showings which are more important in this than in any other part of the body. There is no possibility however of an exact mathematical location of the projectile in such a region where it is essentially mobile; nor will a radiologic examination



always give a very precise anatomical localization. As a consequence the surgeon before attempting extraction should have at his disposal all useful means of research for a projectile such as intermittent screen control, the electrovibrator, compass apparatus, etc. For the same reason, and especially because the mediastinum is a dangerous region, difficult and dark routes of approach ought to be avoided, except in cases of minor mediastinal surgery and for projectiles that are not embedded very deeply or are easily reached. Mediastinal surgery must be a surgery with large openings and full light.

The extrapleural, transternal, cervical (with or without resection of the clavicle), the trans- or extrapleural posterior routes all have particular and limited indications in mediastinal surgery. The necessity of having plenty of light gives to the wide transpleural routes a considerable superiority over the extrapleural or the restricted transpleural routes. The anterior or anterolateral transpleural route gives a very direct access even to the posterior mediastinum, much easier and much more commodious than the posterior or posterolateral route.

The method of choice ought to fulfill the following conditions: (1) it must give a very large opening which is easily enlarged in case of need; (2) it must give as direct an approach as possible to the mediastinum; (3) when the operation is terminated, it must permit the integral repair of the wall.

A costal flap hinged externally and intercostal incision with the section of one, two, or even three costal cartilages responds excellently to these three conditions. This is the operation of choice for all deep-seated mediastinal projectiles or those difficultly situated between the planes of the diaphragm and clavicle.

In 34 operations for the extraction of mediastinal projections, the foreign body was found in all and extracted in 32 cases. These were cases in which the projectile was in the mediastinum itself.

Serious operative complications are rare; hæmorrhage, which is most to be feared, has never been alarming, and is easily checked by tamponade.

The results of the 34 operations were 32 recoveries and 2 deaths. One of the deaths was in a case where the projectile was extracted from the cavity of the left auricle. This should not legitimately be included in this series; omitting it, the deaths were one in 33 cases.

Prudent dissection of the organs in the mediastinum does not give any cause for grave prognosis. The dangerous region is that of the pulmonary pedicle. In paramediastinal operations the author has had three deaths after operations for the extraction of a projectile situated in the pedicle.

As regards the end-results in all patients operated upon by the hinged costal flap method, fixity of the flap has been rigorously obtained. From the point of view of solidity of the thoracic wall the hinged costal flap gives very superior results to those

obtained in complete costal resection, even if limited. As far as the author has been able to judge, the general end-results have been excellent; but it is too early to formulate any definite opinion. All that can be said with certainty is that those patients who have undergone the extraction of a foreign body situated in the mediastinum have declared themselves to be completely satisfied with the results; their physical, moral, and general condition has been transformed after the operation; and the majority of their disabilities have either disappeared or been greatly relieved.

W. A. BRENNAN.

## TRACHEA AND LUNGS

Taylor, H. L., and Caine, C. E.: *Sarcoma of the Lung*. *Minnesota Med.*, 1918, i, 141.

The patient, a girl aged eleven, gave a negative family history. She had had measles, chicken-pox, whooping cough and mumps, all without sequelæ.

Examination of the chest showed the right side more prominent than the left, the superficial veins dilated and extending from the lower edge of the ribs to the clavicle; the intercostal spaces were tense and bulging. There was absolute flatness on percussion from the second rib to the pelvis on the right side and across the front of the chest to the left border of the sternum. The area of splenic dullness was greatly enlarged. The heart was displaced to the left, the apex beat in the left axillary region. The respiratory murmur was normal over the left lung, absent over the greater part of the right lung except at the apex and along the border of the sternum, where there was a loud bronchial rhonchus. The heart action was very rapid, with loud bruit with the second sound.

Fluoroscopic examination showed clear lung tissue to the second rib, with everything obscure as low as the pelvis. The heart was large and displaced to the left, but otherwise normal. A diagnosis of a rapidly growing sarcoma of the lung was made. Within ten days after the consultation, the circumference of the chest had increased one inch. The patient failed rapidly; a narcotic had to be used for pain and sleeplessness. She died one month later.

At autopsy the abdominal organs were found to be normal. The right side of the diaphragm was pushed down into the abdominal cavity as far as the umbilicus. The liver was dislocated to the left side; the mediastinum and its contents were found entirely to the left of the sternum. The heart was well over in the axillary region. The right side of the heart was tremendously dilated and extended beyond the left side forming the apex. The walls of the right ventricle were very thin. The tricuspid valve was insufficient. The left lung was normal except where it had been collapsed from pressure along its median edge. The distended right pleura contained a broken-down shapeless mass of the consistency of mush which had no resemblance to lung tissue.

Pathologic examination showed a round-cell sarcoma. Many mitotic figures suggested a rapidly growing tumor.

J. L. BUTSCH.

**Soubeyran: Report of 194 Cases of Chest Wounds with 22 Thoracotomies for Lung Wounds** (194 cas de plaies de poitrine suivis de 22 thoracotomies pour plaies du poumon). *Bull. et mém. Soc. de chir. de Par.*, 1918, xlv, 552.

The 194 cases of Soubeyran have resulted in 140 recoveries and 54 deaths. The cases are divided into two series. The first series of 101 from 1915 to June, 1917, gave 76 recoveries. The second series consisted of 93 cases of untransportable grave thoracic wounds. In the first series there were 76 recoveries; 15 of these cases were operated upon and 10 recovered. The second series of 93 cases gave 64 recoveries. In this series 59 were operated upon, of which 42 recovered.

Of the total 194 cases, 173 were closed thoracic wounds, 95 in the first and 78 in the second series. The 173 cases have given 133 recoveries and 40 deaths; 116 were not operated upon, with 87 recoveries; 57 were operated upon with 46 recoveries. There were 21 cases of open thoracic wounds with 14 deaths; 17 were operated upon, with 6 recoveries; 4 were not operated upon and 2 recovered.

The immediate operations were as follows: in 38 cases, a simple parietal operation with 33 recoveries; in 14 cases, a pleural parietal operation with 13 recoveries; in 22 cases, operations on the lung, thoracotomy, with 8 recoveries and 14 deaths.

The operations on the lung consisted of 17 pulmonary ligatures (12 deaths); 1 pulmonary resection (1 death); 4 extractions of large foreign bodies (1 death). If cases of multiple wounds are deducted there remain 16 thoracotomies with 8 deaths.

The secondary operations were as follows: (a) 17 operations for empyema; 13 of these were patients

not previously operated upon, and gave 3 recoveries; 4 were patients primarily operated upon and gave 1 recovery and 3 deaths; (b) 17 thoraco-abdominal cases; 7 primarily non-operated cases gave 2 recoveries and 5 deaths; 10 primarily operated cases gave 4 recoveries and 6 deaths; (c) 2 operated upon for secondary hæmorrhage, with 2 deaths; (d) 8 cases operated upon for extensive subcutaneous emphysema, with 3 recoveries.

Soubeyran thinks that in the majority of pulmonary operations it is preferable to drain because in most cases of complete suture it has been necessary to reopen the wound in order to drain pleural infections. In patients with pulmonary wounds, whether operated upon or not, hæmorrhage is less to be feared than early pleuropulmonary infective complications. These may cause death within eight days following the injury. The lungs examined in the course of operation have been much discolored, infiltrated, and damaged by the passage of the projectile. Theoretically, surgical hæmostasis is the operation of choice for pulmonary hæmorrhage, but practically such patients are too shocked to stand operation; moreover, it must be remembered that the lung has a tendency to spontaneous hæmostasis.

It is difficult to differentiate between traumatic shock and menacing hæmorrhage. While operation can save a man threatened by hæmorrhage, such cases are rare. In many such cases Soubeyran has observed during operation that the lung no longer bleeds, and that the hæmorrhage was from an abundant hæmothorax alone. While not doubting the necessity for operation in certain well determined thoracic conditions, yet he thinks that such cases are not frequent. Operation is grave and may hasten the course of events. He is convinced that abstention should be the procedure in the great majority of lung wounds. A résumé of 22 cases of thoracotomy is given.

W. A. BRENNAN.

## SURGERY OF THE ABDOMEN

### ABDOMINAL WALL AND PERITONEUM

**Meredith, E. W.: Pneumococcic Peritonitis.** *Penn. M. J.*, 1918, xxi, 556.

Pneumococcic peritonitis is a local manifestation of a pneumococcal septicæmia. It is rare in adults; nearly all cases occur in children under ten years of age, and in girls more frequently than in boys. As a rule there are no prodromal symptoms. The patient is suddenly taken ill with abdominal pain, vomiting; high fever, and rapid pulse. Diarrhœa may appear as one of the initial symptoms but is frequently delayed for a day or two. The pain is usually diffuse over the entire abdomen, and facies abdominalis occurs early. The central nervous system is commonly involved in the severe toxæmia. The leucocyte count is usually increased to 20,000 or 30,000. The physical signs are not clear-cut;

there will be noted slight rigidity, some tenderness but with no maximum point and no distention.

After several days or a week, distention with signs of peritoneal exudate appears, and the general condition of the patient improves. A subacute or chronic phase of the disease then ensues, with localized collection of pus in the abdomen, usually subumbilical, which if not opened and drained, may spontaneously rupture through the umbilicus or bowel.

The one striking feature in the diagnosis of pneumococcic peritonitis is the marked contrast between the severe systemic reaction and the meager abdominal signs peculiar to peritonitis. Abdominal findings in perforative or appendiceal peritonitis as a rule overshadow the constitutional symptoms; in pneumococcic peritonitis the reverse is true. Typhoid fever can be differentiated by the



leucocytosis, rapid pulse, and history of sudden onset.

The mortality is high in the diffuse types. In the localized type practically all cases should recover, if surgical intervention is reasonably early and simple drainage established. In the diffuse type non-operative measures designed to cause subsidence and localization should be used until the stormy symptoms subside.

E. B. FREILICH.

**Bolognesi, G.: Internal Herniæ of the Peritoneal Fossæ** (Su le hernie interne delle fossette peritoneali). *Clin. chir.*, Milano, 1917, xxv, 250.

By internal herniæ as differentiated from the more common external type are meant all herniæ developing exclusively intra-abdominally. Among these internal herniæ there is one group which may be termed herniæ of the normal peritoneal fossæ, which was first accurately described by Jonnesco in 1890. Although Treitz in 1857 had fully described retroperitoneal herniæ, his work as referring to peritoneal herniæ was not complete, and it was Jonnesco who first gave a complete description of these herniæ, describing them under four varieties, namely, herniæ of the duodenal, cæcal, and sigmoidal fossæ, and those of the great omentum through Winslow's foramen.

Bolognesi sketches the normal anatomy of the peritoneal fossæ, viz.: (1) the duodenal fossæ, subdivided into the inferior, superior, and duodeno-jejunal fossettes; (2) the cæcal fossæ, subdivided into the ileocæcal, ileo-appendicular, and retro-cæcal fossettes; (3) the sigmoidal fossæ; and (4) the omentum (Winslow's foramen). Illustrations of these varieties are given from studies made by the author on the cadaver.

The surgical anatomy shows that all the varieties of peritoneal cavities differ in shape. The duodenal type of fossa is deep with wide bottom and narrow top; the cæcal fossa has a narrow and pointed bottom with a rather broad collar; the sigmoidal fossa has a still more pointed bottom with a broader collar.

Careful research of the literature up to 1890 made by Jonnesco showed 64 cases of herniæ of the peritoneal fossæ; 18 of these cases, especially those reported in very early literature, were more or less doubtful. Since 1890 the literature has been searched by Bolognesi. Including the cases gathered by Jonnesco, there are at present about 164 cases of authentic retroperitoneal periduodenal herniæ reported. These 164 cases are distributed as follows: for the duodenal fossæ, 100 cases; for the cæcal cavities, 30 cases, including one personal case by Bolognesi which is fully described in this article; 4 cases in the sigmoidal cavities, and 30 cases in the great omentum. The condition is twice as prevalent in males as in females and it mostly occurs in adults between the ages of twenty and thirty years.

The author discusses the etiology, symptoms, and diagnosis. Although the possibility of an exact

diagnosis exists, as the reports of certain cases in literature prove, yet generally the hernia is mistaken for some other abdominal condition. It must be differentiated especially from tumors of the stomach and spleen; pancreatic, mesenteric, and omental cysts; retroperitoneal cysts and intestinal tumors. The diagnosis of hernia is especially difficult or impossible if it is very voluminous and presents the picture of an intestinal occlusion.

Wagner collected 28 cases surgically treated up to 1916. Operative treatment does not differ essentially from that of the treatment of herniæ in general, high supra-umbilical laparotomy or a median laparotomy, according to the conditions, finding and reducing the hernial sac, removing the sac and reconstructing the parts. The operative mortality is about 50 per cent, according to the majority of authors.

The author draws two conclusions from his study: first, that the structure of the different peritoneal cavities explains the different degrees of frequency of herniæ in these cavities; secondly, that it is possible to diagnose a retroperitoneal hernia as well as to devise a favorable surgical treatment.

W. A. BRENNAN.

**Bloodgood, J. C.: The Importance of Recognizing the Weakness or the Obliteration of the Conjoined Tendon in Operations for Inguinal Hernia.** *South. M. J.*, 1918, xi, 366.

In the selective regulations registrants with small reducible herniæ are accepted for general military service (Class A) subject to immediate call, and registrants with larger or irreducible herniæ, otherwise physically and mentally fit, are accepted in the deferred remediable group (Class B) to be called by the Provost Marshal General when cured by operation under the supervision of the Surgeon General.

The author published the results of almost 500 operations for herniæ and discovered the chief cause of recurrence in the lower angle of the wound was the obliteration of the conjoined tendon. This type of hernia was observed in about 5 per cent of the cases and the failure to cure in this group was almost 50 per cent, despite the scheme discovered by Woelfler of transplanting the rectus muscle to strengthen the lower angle of the wound, or that of Halsted, of Johns Hopkins, of turning down a flap of the anterior rectus sheath.

A patient, thirty-two years old, with double inguinal herniæ in which the conjoined tendon was completely obliterated, was operated upon by the author. This type of hernia can be recognized with the patient on his back; the finger is pressed against the scrotum and passes through the external ring, meeting no obstruction, and enters at once into the peritoneal cavity. The index finger easily passes through the external ring and one can palpate the pubic bone. The tips of the fingers meet when both are introduced at the same time. When the patient stood or coughed, the hernia appeared as

a bulging in the region of the external ring but disappeared when he was in a recumbent position. The tissues forming the bulging were not divided and there was no distinct sack. The rectus in its sheath was immovable; the internal oblique muscle could not be brought down to the pubic bone, therefore it was impossible to approximate the structures. In hernia of longer duration and larger size, the tension of the peritoneal protrusion may stretch the surrounding abdominal muscles and fat, and thus allow suturing.

The author sutured the rectus muscle and a piece of fascial flap made by blunt dissection and division of some of the fibers of the rectus muscle to Poupart's ligament snugly over the cord which was pressed against the pubic bone.

The second suture included the internal oblique and the rectus muscle and its sheath to Poupart's ligament which supplied the defect of the conjoined tendon. Because on the lower and outer side there is only fascia which may easily split, No. 0 chromic catgut instead of silk in a French needle is employed where the tension is great.

When the ordinary operation was performed, even where the cord was transplanted, 50 per cent of the cases recurred. Under the method of transplanting the rectus and its sheath, from 10 to 15 per cent recurred.

The chances of permanent cure of inguinal herniæ in which the conjoined tendon is wide and firm are 98 per cent.

In training camps, operation for herniæ under local anæsthesia is undoubtedly safer than general anæsthesia because of the huge number of contagious patients in the base hospital.

In the medical corps of America and Canada, surgeons state that soldiers operated upon for hernia are constantly complaining of scar pain. Certain types of individuals complain of scar pain irrespective of the position, extent, or character of the scar.

F. P. HAMMOND.

### GASTRO-INTESTINAL TRACT

**Crohn, B. B.:** Studies in Fractional Estimation of Gastric Contents; Effects of Antacid Medication on Gastric Acidity and Secretion. *Am. J. M. Sc.*, 1918, clv, 801.

The effect of antacid medication on human stomach secretions is in dispute. One group of investigators claims the giving of alkali salts diminishes the acid-secreting tubules of the stomach and causes atrophy, while another set of experimentors claims alkali medication will produce a hyperacidity.

The author carried out experiments in patients with mild functional disorder.

Oatmeal gruel was given in the morning on an empty stomach and the chyme removed every fifteen minutes until the stomach was empty.

1. One grain of magnesium oxide was given one-half hour before the test meal. Mild hyperchlorhydria existed for three-quarters of an hour during

the height of digestion and became hyperchlorhydria of a greater degree for one and three-quarters hours afterward.

2. Bicarbonate of soda two grains given three-quarters of an hour after the onset of digestion lowered the acidity for fifteen minutes and then produced an acidity higher than that found before alkali was given and maintained it for one-half hour.

3. Magnesium oxide twelve grains given one and three-quarter hours after taking the test meal caused a rapid neutralization of acidity without secondary rise.

4. With kaolin as an inert mineral substance no effect was noted.

5. Atropine given hypodermically produced no elimination in acidity nor effect on motility.

6. In cases of Reichmann's disease or continued hypersecretion, atropine given hypodermically diminished hypersecretion and hyperacidity. Motility was not affected.

7. Olive oil did not affect motility, but in case of continuous hypersecretion the acidity was lowered.

8. The giving of compound alkali medication resulted the same as the above experiments.

I. E. BISHKOW.

**Bruchi, I.:** A Case of Trichobezoar; Hairy Tumor of the Stomach (Un caso di tricobezoar; tumore peloso dello stomaco). *Riforma med.*, Napoli, 1918, xxxiv, 327.

Bruchi's case of this rare tumor was in a girl aged seventeen years, a confirmed hair eater. In the epigastric region a swelling was observed, but its nature could not be determined. The diagnosis was a stomach tumor of unknown character. On operation the stomach wall was normal in appearance. On incising the anterior face for about 15 cm. a hairy tumor weighing about 580 gr. and varying from 18 to 29 cm. in circumference was extracted. It was composed exclusively of matted long hairs. The stomach wall was much thickened. The patient made an uneventful recovery.

The author reviews the literature of hairy tumors of the stomach. Ledra collected 70 cases up to 1914 and a few cases have since been published, bringing the total to 75. It occurs almost exclusively in females. Such tumors can be tolerated a long time without distress to the patient. Diagnosis is difficult unless hairs are discovered in the vomitus or feces. In Ledra's 70 collected cases the nature of the tumor was verified by operation in 41 cases and in only 9 cases was a correct diagnosis made.

W. A. BRENNAN.

**Held, I. W., and Gross, M. H.:** Roentgen Rays as an Aid in the Diagnosis of Ulcus Ventriculi. *Am. J. M. Sc.*, 1918, clv, 713.

The authors discuss roentgen ray physiology of the stomach, and the following physiological phenomena: position and form of the stomach, tonus and peristalsis, gastric secretion, mode of filling and



motility, and mobility. The same functional disturbances express themselves differently depending on the underlying tone of the stomach. Hence the interpretation of the roentgen ray findings must be guided by whether the stomach is ortho-, hypo-, or hypertonic.

Roentgen ray observation in ulcer simplex, independent of the tone of the stomach, must be directed to the following cardinal points: mode of filling, position and peristalsis; sensitive pressure points; secretions; standing contraction; time of emptying.

For roentgen ray differentiation of ulcer ventriculi from chronic appendicitis the following points are useful: individuals with orthotonic stomachs will show characteristics of hypertonicity due to reflex disturbance of the vagus from chronic appendicitis; individuals of the asthenic type, when the stomach is full, show the characteristics of the hypotonic stomach, the most important finding being delay in the ileum.

Cholelithiasis with gastric symptoms simulates more often clinically and roentgenologically ulcer duodeni. Individuals with disturbed intermediary metabolism, such as phosphaturia and oxaluria, are very frequently subject to gastric symptoms simulating ulcer. The diagnosis rests with complete examination of the urine and the favorable results obtained by properly applied therapeutics.

The roentgen ray directly visualizes the existence as well as the seat of complicated ulcers in the great number of cases. Callous ulcer is best demonstrated when situated, as it often is, on the lesser curvature. Penetrating ulcer manifests itself as a niche filled with contrast substance, on top of which a small air-bag is seen after the stomach has emptied itself.

Organic hour-glass stomach manifestations due to ulcer are the following: When the contrast food is taken, only the cardia fills, forming a round ball lying directly under the diaphragm. From time to time only a string of contrast substance is seen to dribble down to the lower compartment, forming two distinct portions. A callous ulcer in the region of the pylorus results in stenosis of various degrees, depending upon whether the pylorus is incompletely or completely occluded.

With incomplete obstruction one sees the elongated pylorus without any activity. If obstruction is complete, the characteristic half-moonshaped or boat-shaped organ results.

A deep-seated ulcer or adhesions at the pars pylorica is characterized by a horizontal, light, prepyloric zone between the contrast meal above and the pyloric part below. Pyloric ulcers complicated by peripyloric adhesions manifest themselves roentgenologically by irregularities of the pylorus, stretching of the pylorus to the right of the median line, and inability to act with respiration.

Extensive adhesions posteriorly give the stomach the appearance of a transversely high situated stomach with restricted mobility and very superficial peristalsis.

E. B. FREILICH.

Deaver, J. B.: *Peptic Ulcer. Surg., Gynec. & Obst.*, 1918, xxvi, 489.

The toxæmic origin of peptic ulcer is generally recognized and there seems little doubt that infection is the primary cause of the toxæmia in the vast majority of cases. Furthermore, clinical experience in recent years is indicating more and more clearly that the original site of the infection lies in the vermiform appendix, and Rosenow's demonstration of the elective localization of micro-organisms, especially streptococci, is additional confirmation of the infectious origin of these ulcers and similar lesions. From Bolton's careful histological studies, it is learned that the initial lesions which give rise to ulcer of the stomach are: (1) localized necrosis of the mucous membrane; (2) localized hæmorrhage; and (3) inflammation of the lymphatic follicles.

1. The common cause of necrosis is bacterial infection or its toxins circulating in the blood stream and, as pointed out by Bolton, the cells of the gastric mucosa being primarily attacked by the poisons in the circulation, necrosis is readily produced by the local action of the gastric juice. Necrosis may arise in this way without any preceding hæmorrhage or lymphatic inflammation.

2. Hæmorrhage is an actual and frequent cause of ulcer and is likewise due to bacterial toxins circulating in the blood stream, which, destroying the endothelial cells of the capillaries, pave the way for the local destructive action of the gastric juice.

3. Inflammation of one or more of the lymphatic follicles, so thickly studded along the lesser curvature of the stomach, especially toward the pylorus, may give rise to a submucous abscess which by rupture into the gastric cavity allows the juice to act on the base of the ulceration thus exposed.

In fact, it is doubtful whether a true peptic ulcer, as distinguished from an erosion, ever heals under purely medical treatment. The so-called cures represent a latency which, there is no telling how soon, is apt to be aroused to activity. With the aid of the X-ray, the various clinical tests, and a carefully taken history, a correct pre-operative diagnosis of ulcer has been made in 88 per cent of the author's patients during the past year. Of the patients operated upon for peptic ulcers during the past eighteen months, 90 per cent of those traced reported complete cures.

For a chronic ulcer of the duodenum he believes that excision of the ulcer is the best method of treatment. If the ulcer is easily accessible, which it usually is if located on the anterior or outer wall of the bowel, its complete removal by excision presents no difficulty. But where there is marked and extensive induration, complete excision of an ulcer is not always an easy operation; indeed, it may be a dangerous one except in the hands of the experienced abdominal surgeon. The occasional operator in such a case had better content himself with a gastrojejunostomy. Deaver believes that the surgeon's first effort should be directed toward the removal of the diseased area, and that gastrojejun-

ostomy as a supplemental operation, though generally effective in preventing a recurrence, cannot always be relied upon of itself to cure a fully developed chronic ulcer.

Not only is it necessary to treat the ulcer at the time of operation, but it is equally important to endeavor to discover the focus of intra-abdominal infection that is the real offender in the case.

Excision of a gastric ulcer would be as desirable as it is for ulcer of the duodenum were it always as safe and always feasible. While he considers it best suited for ulcers located at some distance from the pylorus, he does not hesitate to say that it should be the operation of first choice in indurated ulcers, irrespective of location; that is to say, pylorotomy or partial gastrectomy for pyloric ulcers, wedge-shaped or circular resection of ulcers on the lesser curvature, and for ulcers on the posterior wall transgastric resection or resection by way of the enterocolo-epiploic route. By this same route ulcers on the posterior wall of the duodenum adherent to the pancreas, with few exceptions, are rendered accessible and amenable to excision. Excision should be attempted only in the absence of encumbering adhesions and where the patient seems able to withstand what often proves to be a rather tedious operation.

Ulcers on the posterior wall of the stomach invading the coats are best exposed and disposed of by dissecting the gastrocolic omentum from the transverse mesocolon, lifting up the greater omentum, when the entire posterior wall of the stomach may be beautifully shown, also the duodenum and pancreas. Deaver believes that Finney's method of pyloroplasty should be employed only where gastric motility is good, where perigastritis is absent, and where the pylorus is not involved in cicatricial tissues. As there are few cases presenting these favorable conditions, the operation would have only a limited application.

If the anastomosis is made, not in the fundus of the stomach but in the pyloric antrum, the anastomotic opening will functionate even when the pylorus is patulous, and even though the gastric contents do not leave the stomach through the new opening but are still being discharged through the pylorus, gastrojejunostomy is a curative measure for the ulcer, inasmuch as it reduces hyperacidity by permitting the admixture of the bile and pancreatic juices with the stomach contents.

The only reasonable conclusion, according to Deaver, is that the value of gastro-enterostomy lies in the increased alkalinity of the gastric contents obtained by admitting to the stomach through the anastomotic opening the alkaline duodenal secretions. Therefore, it seems doubtful whether primary occlusion of the pylorus is of any value.

Vicious circle following gastro-enterostomy is a very unusual occurrence in these days, but so-called marginal ulcers developing around the gastro-enterostomy opening are, unfortunately, still being recorded, although the percentage of cases is small.

One of the most serious, if not the most serious, menace of chronic peptic ulcer is of course perforation. This complication is generally said to occur in about 4 per cent of all cases, but the proportion is much greater if only those cases that come to operation are considered. About 70 per cent of the perforations occur from ulcers on the anterior wall of the stomach, those on the anterior wall toward the pylorus forming about 80 per cent of the total. About 18 per cent occur on the posterior wall, while the fundus and the cardia are very exceptionally the site of perforating ulcers. The dominant symptoms are acute, overwhelming pain, vomiting, fall of temperature, rise of pulse, shock occasionally, and peritoneal reaction, i. e., early rigidity followed in from ten to eleven hours by distention. The differentiation between a perforating gastric or duodenal ulcer is not possible, as a rule, nor is it essential, for the treatment for either or both is surgery and the earlier the intervention the better the prognosis.

Primary gastrojejunostomy as a part of the operation for perforating gastric or duodenal ulcer is becoming more and more recognized as a useful procedure in properly selected cases and in the hands of the surgeon accustomed to working in the abdominal cavity.

The perforation should be closed with linen sutures and reinforced with a tag of omentum when necessary. Unless the peritonitis is extensive and the patient's condition is grave, Deaver does a primary gastro-enterostomy. He also removes the appendix, examines the gall-bladder and pancreas, and if either of the latter is diseased, he deals with it as indications present. D. N. EISENDRATH.

**Scully, F. J.: Perforated Gastric and Duodenal Ulcer; a Statistical Report of 59 Cases. *Am. J. M. Sc.*, 1918, clv, 874.**

From 1911 to 1916 inclusive 59 cases of perforated gastric and duodenal ulcer were admitted to Cook County Hospital; 48 were gastric and 11 duodenal. Of the series, 49 were operated upon and 10 discovered at autopsy.

From the total number of ulcer cases admitted, its frequency of perforation in gastric ulcer is 9.4 per cent and 15 per cent in duodenal ulcer. There were 44 perforations in males, and 4 in females. The majority of perforations occurred between the ages of thirty and forty in gastric ulcer, and between twenty and thirty years in duodenal ulcer.

In the majority of cases previous gastric disturbances were present. The most constant premonitory symptom was slight pain in the upper abdomen. Vomiting occurred in several cases. No single factor seemed to be the determining cause of perforation.

The onset in practically every case was sudden, with agonizing pain in the epigastrium. Vomiting occurred in the majority of cases shortly after perforation. Following the onset there is a period of remission for from two to three hours. At this time



the diagnosis may be overlooked. The recurrence of pain indicates the onset of peritonitis.

The point of maximum tenderness corresponded to the point of maximum pain. Rigidity was present in most cases. Fluid was not easily detected. Thirteen cases were in shock on entrance; 8 cases were moribund on entrance. The pulse and leucocyte count increased in later stages. Diagnosis was made in 28 cases preceding operation.

Of the 49 cases operated upon, 21 recovered and 28 died. The mortality of operated cases was 60 per cent in gastric ulcer and 44.4 per cent in duodenal ulcer.

I. E. BISHKOW.

**Sneath, W. A.: Choledcho-Enterostomy for Constriction of the Common Bile-Duct Following a Perforated Duodenal Ulcer.** *Brit. M. J.*, 1918, 1, 531.

The patient came to the hospital to have an incisional hernia the size of a football repaired. He gave a history of having been operated upon six months earlier. Following his operation he drained bile for three months. There was a healed scar in the right iliac fossa.

The patient was in an emaciated condition, jaundiced, and could not eat proteid and fatty foods. The fæces were clay-colored and contained no bile. The urine contained bile. His temperature rose to 101° five days after admission, and large quantities of bile again drained from the sinus. The jaundice disappeared following this, but there was no bile in the fæces.

It was decided to operate, to dissect out the sinus tract and to repair the hernia. The omentum was adherent to the hernial sac and to the liver. The transverse colon was also adherent to the liver. Loops of small intestine were adherent to the sac; in their removal they were damaged and had to be repaired. After freeing the sac, the biliary sinus was dissected out and traced downward and backward where it entered a large cystic swelling, which was lined with mucous membrane and contained six ounces of thick, viscid, green bile. Further investigation showed it to be a large dilatation in the common duct. The gall-bladder was fibrosed and contracted and contained only a small quantity of mucus. The pylorus was adherent to its neck. Many other adhesions existed between the omentum, small intestines and stomach, but they were not disturbed.

The opening in the dilated common duct was brought forward and sutured to the peritoneum; a drainage tube was inserted into the cyst. A tube was also sutured into the gall-bladder. The hernia was repaired. After the operation the fæces continued to be clay-colored, and the sinus showed no attempt to close.

The most likely explanation of the condition was thought to be that there had been a perforating duodenal ulcer, the cicatrix of which had constricted the common duct. The local inflammation around the gall-bladder and cystic duct caused obliteration

of the duct so that the gall-bladder did not yield to pressure of the secreted bile.

This surmise was later confirmed. The patient had been operated upon six months earlier for a perforated duodenal ulcer with general peritonitis. There was much pus in the peritoneal cavity and the counter-opening was made for drainage. Since there was no bile entering the intestine it was decided to do a second operation to endeavor to construct a new channel by making an opening between the dilated common bile-duct and the small intestine.

The abdomen was again opened, the sinus dissected out down to the dilated duct, which had, however, contracted considerably. The opening in the dilated duct was clamped. A loop of jejunum was then brought up through the transverse mesocolon and an anastomosis was made between this loop and the dilated bile-duct. This was difficult on account of the depth of the duct and friability of its walls. Considerable tension remained on the unevenly placed sutures. An anastomosis was made between the two loops of the jejunum under the surface of the transverse colon, in order to prevent intestinal obstruction.

The postoperative convalescence was full of anxiety. There was much vomiting, a temperature of 101°, and a rapid pulse; a discharge of bile and digestive juices; and much excoriation of the skin. The patient became emaciated and lost appetite. The fæces were pale and fatty. On the sixth day the discharge of bile and juices became less and by the fourteenth day the discharge had ceased, the stools contained bile, the appetite returned, and the patient began to put on weight. Six weeks later the patient was discharged looking extremely well.

J. L. BUTSCH.

**Christopherson, J. B., and Izzedin, M.: Acute Intestinal Obstruction by Tape-Worms.** *Brit. M. J.*, 1918, 1, 697.

The author reports a case of intestinal obstruction at the ileocæcal valve due to the accumulation of four or five tape-worms. The patient, a Sudanese aged forty, suffered a sudden attack and vomited twice during the night; the abdomen was greatly distended; peristalsis could be definitely made out. The patient was very uncomfortable from distention but suffered no obvious pain. The pulse was 84, full and regular. He could pass neither fæces nor flatus. Rectal examination revealed only an empty rectum. There was no effect from three enemas. Vomiting of intestinal contents occurred twice after admission. Operation was decided upon.

An incision extending from the xiphoid cartilage to the symphysis pubis was made. The small intestine was explored from the duodenum to the ileocæcal valve; it was much distended. The large bowel collapsed from the cæcum onward. No cause for the obstruction was found; it was thought to be a kink or some similar obstruction. The small intestines were taken from above downward and

passed through the gloved hand from segment to segment to press the flatus onward, but this was unsuccessful. The small intestine was then punctured in six places with a trocar and the gas allowed to escape. The wound was closed and the patient sent back to bed.

The next morning the abdomen was somewhat distended, but the patient passed flatus. Two enemas were given. On the third day after the operation a tube was passed into the rectum and one and one-half ounces of castor oil were given by mouth. A large mass of tape-worms was passed, which measured about three pints. It was this mass impacted against the ileocecal valve which caused the obstruction.

J. L. BUTSCH.

**Urrutia, R.: Intussusception of the Small Intestine by Sarcoma** (Invaginación por sarcoma del intestino delgado). *Prog. de la Clin.*, Madrid, 1918, vi, Supp., 185.

The patient was a man of fifty years, with symptoms of acute intestinal obstruction. On opening the abdomen a quantity of reddish fluid escaped. Some enormously distended loops of small intestines were seen. The cæcum and colon were collapsed. On disengaging the dilated loops a typical descending intussusception was observed in the right iliac fossa. The intestine was collapsed beyond this as far as the ileocecal valve.

The intussusception was easily reduced; the portion involved was black and contained a smooth mass implanted in the thickness of the wall, which appeared to be a tumor. The adjacent mesentery was black and infiltrated with blood. Twenty centimeters of intestine were resected and an end-to-end anastomosis done. The patient died shortly after the operation. The tumor was pediculated and showed a necrotic, ulcerated mass at its center. Histologic examination showed it to be a lymphosarcoma.

Malignant tumors of the small intestine are rather rare, but sarcoma is more frequent than carcinoma. Crowther found 188 cases of sarcoma in the literature up to 1913. Intussusception due to tumors, especially malignant tumors, is rare. Kasemeyer found that out of 284 reported cases, 52 were carcinomatous tumors, 26 were sarcomatous, and 7 undetermined. The author thinks the development of hæmorrhagic ascites caused the fatal termination of his case. W. A. BRENNAN.

**Link, G.: Appendicitis.** *J. Indiana St. M. Ass.*, 1918, xi, 93.

Link offers the following conclusions: Acute appendicitis is a suppurative process from the beginning. Strictures, kinks, coproliths and anatomic defects when present may cause rupture. There is no medicine or treatment that will arrest suppuration in the appendix, dissolve a stricture, undo a kink, remove a coprolith or change an anatomic defect. Therefore there is no medical treatment for appendicitis.

If any appendicitis cases are operated upon in their

homes, they should be the clean cases. All pus cases should be sent to a hospital. Moving the patient does little harm and is far outweighed by the advantages gained.

The earlier in the disease the physician makes the diagnosis and places the patient in a hospital, the more surely can the surgeon carry the case to a successful issue.

ALBERT EHRENFRIED.

**Taylor, G.: Temporary Cæcostomy in Resection of the Distal Portion of the Colon for Non-Obstructive Conditions.** *Brit. M. J.*, 1918, i, 667.

This expedient is used by the author for three conditions: (1) resection of the large intestine for carcinoma without obstruction; (2) to close a proximal inguinal colostomy; (3) for gunshot injury when resection is indicated.

The author says the opening acts as a vent for gases generated in the colon above and near the suture line, and acts as a safety valve in preventing any strain on the juncture.

The cæcum is simply anchored to the parietal peritoneum. The opening closes very readily, especially if the drainage tube in the cæcum be inserted after the manner of a Senn's gastrostomy. No operation is necessary to close the cæcostomy. The stoma generally closes in ten days to a fortnight.

J. L. BUTSCH.

**Mocquot, P., and Fey, B.: War Wounds of the Rectum** (Plaies du rectum par projectiles de guerre). *Bull. et mém. Soc. de chir. de Par.*, 1918, xliv, 259.

Among more than 6,000 wounded treated in the authors' ambulance, 30 wounds of the rectum have been observed. These include 4 wounds of the peritoneal rectum; 19 of the subperitoneal rectum and anus, and 7 recto-urinary wounds. The 4 peritoneal rectal wounds were penetrating multivisceral abdominal wounds which, besides the rectum, involved other parts of the intestinal tract. Two died shortly after operation. The third case in which the rectal injury had not been discovered or treated died after four days. The fourth recovered. In the 19 subperitoneal lesions the entry wound was almost always in the sacral or buttock region and very frequently accompanied by lesions of the regional bones. Such wounds rapidly become gangrenous and give rise to complications such as fistulæ or strictures. In the 19 cases there were 10 recoveries and 9 deaths.

Wounds of the subperitoneal rectum and anus give three principal indications: (1) treatment of the soft and skeletal parts; (2) treatment of the rectal wound; (3) exclusion of the rectum by an iliac anus.

Five of the 19 cases were treated by simple toilet of the wound without suture of the rectal wound or exclusion of the rectum. In 2 cases operation was insufficient and the patients died. The other three recovered but all had a rectal fistula.

Eight cases were treated by toilet of the wound, and suture of the rectal wound without exclusion. Three have been cured but two have fistulæ;



1 case is progressing toward recovery; 4 died. The study of the cases have shown the authors that when in severe cases there are grave peritoneal lesions with large muscular and bone damage, cleansing and rectal suture do not suffice. Ordinarily on account of the spread of infection the sutures hold only for a few days. In 2 of the cases an iliac anus operation was done but it was too late; if this had been done in time, the men might have been saved. In 2 cases the wound was cleansed and an iliac anus created without suture of the rectal wound. Both had severe lesions of the anal canal and of the lower ampulla, with regional bone injuries. Both have recovered.

Two cases with very extensive lesions and in a poor condition had the rectum sutured and an iliac anus created; both died.

The authors think that slight wounds of the rectum may recover spontaneously, but that this can not be counted upon. Generally, untreated, unsutured wounds are exposed to gangrene or pelvic cellulitis. If the wounds are opened up and treated but not sutured, they usually recover with a fistula if the damage is not very extensive. The sutures do not always hold and generally give way by the eighth or tenth day causing a fistula, but even so the chances of early infection are avoided and the parts have time to put themselves in a state of defense.

Exclusion of the rectum by creation of an iliac anus is indicated when the anal canal or ampulla is largely damaged, and especially when there are accompanying extensive lesions of the vicinity. The artificial anus should be made as early as possible.

With regard to technique for wounds of the anterior face of the ampulla, a median perineal incision suffices. For large posterior wounds with sacral fractures, transverse opening alone will give sufficient access. When there is no sacral fracture, for postero-anterior wounds the authors use an oblique incision along the edge of the sacrum and coccyx prolonged as far as necessary either above or below. This gives access to the lateral face of the rectum. For a high lateral rectal wound to which approach is very difficult the authors think the rectal wound should be sutured either by a laparotomy or by a sacral resection.

The authors treated 7 rectal wounds with accompanying wound of the bladder or urethra; 4 were high rectovesical wounds and 3 recto-urethral. In all of the first variety a rectovesical fistula developed; 1 recovered, and 3 died. The three latter cases had an iliac anus.

For rectovesical wounds an immediate cystostomy is the treatment of choice. An iliac anus might in addition be of value if there are extensive surrounding injuries, but the authors did not have cases of this kind. Direct suture is only indicated in wounds of the peritoneal rectum and bladder, but these are abdominal wounds and call for laparotomy; in subperitoneal wounds suturing is not indicated but rather spontaneous closure is favored.

In the 3 patients with recto-urethral wounds, the authors did an early suprapubic cystostomy; 1 died, and 2 recovered.

A large number of the cases referred to in this report were received by the authors long after the receipt of the original injury. W. A. BRENNAN.

### LIVER, PANCREAS, AND SPLEEN

**Althabe, A., and Nicholson, E.: Remarks on 240 Cases of Biliary Lithiasis** (Algunos comentarios sobre 240 casos de litiasis biliar). *Semana méd.*, Buenos Aires, 1918, xxv, 393.

The authors have variously employed the technique of Kehr, Mayo Robson, Sprengel, or Kocher, closing the cystic duct stump by a strong ligature after systematic examination of the biliary passages.

The authors' statistics are as follows: (a) simple cases, 212, with 13 deaths; these included 59 cholecystostomies; 137 simple cholecystectomies; 16 cholecystectomies with drainage of bile passages; (b) complicated cases, 28, with 9 deaths; these included 18 cases with concomitant benign conditions in the stomach, intestine, etc., and 10 septic or malignant concomitant lesions.

From the clinical and subsequent histories of these cases the authors deduce these conclusions:

1. Biliary lithiasis is especially frequent in women and is more commonly observed from the twenty-fifth to the thirtieth year.
2. The exaggerated cholesterinæmic diathesis during the genital life of women is a large factor in the origin of lithiasis.
3. Surgical treatment of lithiasis is always indicated when other therapeutic methods have failed.
4. Cholecystectomy with gauze drainage of the cystic stump is the operation of choice.
5. Drainage of the bile passage is not alone sufficient; but in case of canalicular lithiasis or infection of the passages, it alone should be used.

W. A. BRENNAN.

**Abalos, J. B.: Cholecystectomy in Biliary Lithiasis; 100 Cases** (La colecistectomía en la litiasis biliar; 100 observaciones). *Rev. méd. d. Rosario*, 1918, viii, 1.

The author decides on operating according to the following indications:

1. An acute lithiasis in the febrile stage is treated medicinally until an apyretic condition is reached; then operation is done. If infection advances and shows no signs of yielding, operation is done without further delay.
2. If the patient shows icterus without fever, the author follows the same line of action, not operating unless the icterus persists for a considerable time.
3. If the lithiasis is apyretic or without icterus, operation is done at once during a lull in the symptoms.

The author prefers simple cholecystectomy as the method of treatment unless it is formally contra-indicated.

While recurrence is not usual after cholecystectomy, yet there may occur what Kehr has termed a false recurrence, i.e., where there is formation of a calculus having the knot of the ligature of the cystic duct as its nucleus. But the author thinks it well, in order to avoid recurrences, to examine the interhepatic canals and to see that there are no stones which may have migrated there during the manipulations of the operation.

In his technique, in order to avoid the chance of recurrence from a ligature of the pedicle, as stated, the author omits this. He sections the cystic duct between two clamps. The lower clamp near the common duct is inoxidizable and it clamps the cystic artery as well as the cystic duct. After sectioning the duct and removing the gall-bladder, the latter clamp is allowed to remain. A mesh gauze drain is placed and the incision is partly closed. After forty-eight hours generally the gauze and clamp can be withdrawn. Complete closure of the wound can be made after the eighth day.

In his earlier cases the author used nickel clamps. These caused slight suppuration owing to alteration in the tissues by the metallic oxide; but this has not been observed with silver or gold clamps.

The advantage which the author claims for his method is that there is no foreign body left behind which can be the nucleus for a recurrence of calculus. In his series of 100 cases he has had no recurrences.

W. A. BRENNAN.

**Morley, J.: Shell Wound of the Pancreas Causing Pancreatic Pseudocyst.** *Brit. M. J.*, 1918, i, 341.

Gunshot wounds of the pancreas are rarely seen because such wounds are usually fatal from hæmorrhage from accompanying injury to one of the large blood-vessels, or peritonitis results from perforation of the stomach or duodenum. In case laparotomy is performed, these lesions monopolize the surgeon's attention. In a total of 965 penetrating abdominal wounds, only 5 cases of wounds of the pancreas are recorded. The rare cases observed have usually proved fatal.

A case is reported of a penetrating shell wound which gave rise to a large collection of pancreatic juice in the lesser peritoneal sac. The patient had been hit in the back by a shell fragment three weeks before coming under observation. There was pain in the epigastrium but no symptom of peritonitis. After two weeks a large tense swelling developed in the epigastrium and there was rapid loss of flesh. Temperature was 99.4, pulse 100. The case was diagnosed as a subphrenic abscess.

At operation, through an anterior incision, the stomach was found flattened out over the front of the greatly distended lesser sac. A second incision in the loin evacuated four or five pints of clear fluid followed by a little pus. The clear fluid was found to contain trypsin and amylopsin. A fragment of shell one inch in length lay free in the cavity. The patient vomited for ten days but eventually made a complete recovery.

C. A. HEDBLÖM.

**Richey, D. G.: Massive Infarction of the Spleen, with Report of a Case.** *J. Lab. & Clin. Med.*, 1918, iii, 519.

The autopsy findings referable to the spleen in this case revealed an atrophic spleen showing a large area of necrosis, fibrosis, and calcification, and two small peripheral masses of living splenic tissue surrounded by dense fibrous adhesions. The direct cause of the death was a suppurative pneumococcal meningitis following an old otitis media and mastoiditis. The case is of interest because of the splenic findings at necropsy, which were undoubtedly due to massive infarction of the organ. No focus from which an embolus could have arisen was found.

Absence of the spleen may be a congenital anomaly or the result of surgical intervention. The most common findings associated with splenic agenesis are: (1) accessory spleens; (2) generalized lymphatic hyperplasia; and (3) hæmolymp-nodes. References to diminutive spleens are not common in the literature, nor is extensive infarction of the spleen often associated with marked atrophy. Nuzum collected a series of 28 cases of infarction of the entire spleen, of which only 2 were small spleens. The others were large and one weighed 2,700 grams.

P. W. SWEET.

## MISCELLANEOUS

**Portis, M. H.: Lesions of the Right Upper Quadrant of the Abdomen; Differential Diagnosis.** *Med. Clin. N. Am.*, 1918, i, 1297.

In typical cases, differential diagnosis of lesions of the right upper abdominal quadrant is easy, but is very difficult in complicated cases.

The author discusses the chief lesions of this region. Gastric and duodenal ulcer differ in the time of the pain, in the presence of vomiting in gastric and absence of it in uncomplicated duodenal ulcer; there is seasonal recurrence in duodenal ulcer. In both, hæmorrhage is a complication and means a late apprehension of the lesion. Gastric syphilis may be confused with ulcer and cancer.

Gall-stone colic occurs independently of eating, is not relieved by food, and pain is often referred to the right shoulder-blade. Greasy foods are especially likely to occasion pain. Nausea and vomiting in gall-stones may lead to confusion with stomach lesions. The local tenderness and laboratory stomach tests aid in differentiating.

Perforated gastric or duodenal ulcers are distinguished from gall-stone colic by history, and by a quickly succeeding peritonitis. Cholecystitis is usually accompanied by chills and fever, and leucocytosis. The laboratory findings of gastric lesions are absent, and in the interval between attacks tenderness may usually be elicited over the gall-bladder.

In differentiating cancer of the stomach, laboratory analyses are essential, with X-ray diagnosis.

Gastric crises of tabes must always be considered and ruled out.



The colic of chronic plumbism, a highly located inflamed appendix, a Dietl's crisis, renal calculus, renal new-growth, or renal infection are all possible lesions, the last three being definitely determined by cystoscopic examination.

Ruptured extra-uterine pregnancy or ovarian cyst, or acute gastritis and enteritis are to be con-

sidered. Acute pancreatitis, with the prostration and shock out of proportion to the rest of the picture, tumors of the pancreas, and acute intussusception must be differentiated; also diaphragmatic pleurisy, pneumonia of the right lower lobe, subdiaphragmatic abscess, splenic anemia, and syphilis of the liver.

V. E. DUDMAN.

## SURGERY OF THE EXTREMITIES

### DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS, CONDITIONS COMMONLY FOUND IN THE EXTREMITIES

**Keith, A.:** Bone Growth and Bone Repair. *Brit. J. Surg.*, 1918, v, 685.

The author gives a historical review of the investigation as to the growth and repair of bones. He gives credit to Duhamel who took advantage of the work of the English surgeon Belchier. The latter found after feeding animals food containing a dye substance and alternating this diet with an ordinary one, that he could obtain alternated red and white rings or layers on the circumference of the bone, the latest formed layer or plate being on the surface of the bone immediately under the periosteum. In this way he came to regard periosteum as the maternal tissue of bone; the osteogenetic function is Duhamel's discovery.

John Hunter, on the other hand, believed with Haller that the normal periosteum had no bone-producing power and that only arteries could form bone, and if periosteum should under abnormal circumstances become a site of bone formation, then that was merely evidence that its arteries could assume a bone-building power. Hunter's investigations, however, of the healing of fractures agreed with those of Duhamel. The latter regarded the uniting as a progress of the periosteum, while Hunter believed that it came from the broken ends.

Keith states that these two men of the eighteenth century, Duhamel and Hunter, laid the basis of present knowledge as regards the physiology of bone; and of the two, Hunter laid the firmest and deepest part of that foundation.

D. N. EISENDRATH.

**Bertein, P.:** End-Results of 14 Operations for Wounds of the Shoulder-Joint (Résultats éloignés des 14 cas d'interventions pour plaies de guerre de l'articulation scapulo-humérale). *Bull. et mém. Soc. de chir. de Par.*, 1918, xlv, 831.

Bertein's experience leads him to conclude that in shell fractures of the shoulder-joint the operation should be a resection of the head with surgical clearance. If the fracture is cervical, radiating only toward the humeral head, the latter only ought to be resected. The incision should be anterior or antero-external even if the wound is posterior, except in a case where the humeral fracture is associated

with a fracture of the acromial dome, when the posterior incision may be used.

After large resections, sufficient bony regeneration for the formation of a nearthrosis cannot be hoped for. Preservation of the periosteum is often most incomplete and the vitality of the contused torn tissue is very weak; but the scapular musculature ought to be respected to the maximum degree. Owing to its contractility it will partly compensate for the loss of bone substance. In operating, the trochanteric insertions of the active ligaments of the joint should be preserved as far as possible.

Of 18 shoulder fractures treated, 14 were operated upon. In 9 cases the shoulder was resected. The end-results of the 9 resections, some done rather late, were on the whole satisfactory. Five of the patients have a fairly active useful limb in spite of the large osseous sacrifice.

W. A. BRENNAN.

**Hatch, E. S.:** Latent Manifestations of Syphilis in and About Joints. *South. M. J.*, 1918, xi, 431.

Syphilitic lesions in and about joints are much more common than is realized. There is no definite pathologic picture. The diagnosis must be made by exclusion. There are two classes of cases: (1) those in which the joint is primarily affected; and (2) those in which the disease spreads from the surrounding parts.

The main diagnostic point in syphilitic chronic synovitis is the absence of pain or much interference with motion. Pain if present is worse at night. No fluid but irregular lumpy thickenings are present in synovia. Too much stress should not be made on a negative Wassermann. Outside of the X-ray, the luetin test is the chief diagnostic aid.

Before arriving at a diagnosis, tuberculosis, infectious arthritis, hypertrophic arthritis, and in children rickets and scurvy must be ruled out.

LISTER TUHOLSKE.

### FRACTURES AND DISLOCATIONS

**Grossman, J.:** Fractures of the Elbow. *Interst. M. J.*, 1918, xxv, 436.

In the *Medical Record* for January 15, 1916, Grossman reported a series of 50 cases of fracture of the elbow treated by the acute flexion position. Since that time he has collected 60 additional cases, making a total of 110 cases. In one case operative interference was necessary, because the fragment

was so small and the displacement so marked that replacement and retention was impossible. The fragment was removed and the patient made an uneventful recovery. The average time of treatment by his method was four weeks. He succeeded in obtaining cures in the majority and marked improvement in the remainder of the series. In one case the coronoid process of the ulna and in five cases the radial head or neck was fractured.

Fracture of the coronoid process of the ulna is of fairly rare occurrence, while fracture of the head or neck of the radius occurs more commonly and is frequently overlooked. Diagnosis is made upon the presence of restricted pronation, supination, flexion and extension of the elbow and marked localized tenderness over the radial head. In the five cases reported ecchymosis and crepitus were absent, but swelling was present in all the cases. The treatment consisted in placing the limbs in acute flexion, and massage, passive and active movements, and barking were given ten to twelve days later. The synovitis present did not in any way contra-indicate movements on the tenth day, because after that time had elapsed, very little fluid, if any, was present in the joint.

The frequency of fracture of the elbow in children is due to the fact that the elbow is the point of diminished resistance. The lower end of the humerus is in the process of development and ossification and is unprepared to offer resistance to an unusual strain. In cases where children fall upon the outstretched hand, the shock is transmitted from the ground to the shoulder and is centered in the elbow, especially upon the lower extremity of the humerus, and the articular end is not only broken but the fragment usually dislocated. In cases of direct violence, such as falls striking the elbow, or striking the elbow with an object, fractures of the condyles, head, or head and neck of the radius, or olecranon processes are usually the result of the force exerted upon the affected part.

Regarding symptomatology, there will be a history of an injury followed by disability and pain about the elbow-joint. The affected limb is usually supported by the other hand. The forearm is flexed, being held at almost a right angle, midway between pronation and supination. Swelling is very marked, especially in intra-articular fractures. Ecchymosis is usually present, surrounding the elbow in supra-condylar fractures, and in condylar fractures it is localized to the sides of the elbow. Manipulation of the elbow is extremely painful. Flexion and extension, pronation and supination are restricted, the former more so than the latter. Tenderness is very marked, as a rule being localized to the affected area. Crepitus may be elicited in the majority of cases, but it is better to dispense with this sign, first, because of the severe pain which results, and secondly, because the diagnosis is evident without eliciting crepitus. One should not forget the normal relationship which exists between the condyles and the olecranon process in localizing the fracture.

He emphasizes a condition which is fairly common in children, namely, one in which a partial dislocation of the head of the radius resulting from a trauma to the upper extremity is present. The limb hangs limply at the side as if there were a flaccid paralysis. Slight swelling about the elbow may be present. Ecchymosis, crepitus, deformity, and false mobility are absent. Passive flexion and extension are not restricted. Pronation and supination are limited. Upon extreme supination a clicking sound is heard and immediately thereafter the child regains normal use of the limb.

Prognosis in fractures of the elbow is good, with the exception of rare cases of impaction or the interposition of the fragments in the joint where the intra-articular obstacle opposes reposition. These latter cases usually require surgical intervention.

His technique is as follows: An anæsthetic is given. The elbow is flexed to a right angle, and while extension is being made with one hand, the fragments are manipulated into position with the other. The objection to this method is that if kept in this position the recurrence of the deformity is very apt to result. Acute flexion is the only one that is likely to maintain the fragments in good position. Supinate the forearm fully and flex the elbow as far as it will go. This flexed position is maintained by means of adhesive strips and a flannel bandage.

He has outlined a series of exercises for the after-management of these cases, which briefly are as follows:

1. (a) The patient stands straight, heels together, head straight, arms extended at the sides of the body, palms being turned inward; (b) arms are brought straight out, forming a cross with the body; (c) then to the side of the head, touching the ears and as straight as possible; (d) return in the same manner to a position of rest.

2. In the same position as above, (a) start movements from the following position: the elbows close to the side, the forearm bent upon the arm, fists closed with the thumb side to the shoulder; (b) then the arms extended at the sides of the body, (c) then brought out to form a cross, (d) then vertically upward by the side of the head, touching the ears, and as straight as possible.

3. The palms upward, the arm describes a half circle, to rejoin at the sides of the head; there the fingers cross each other, the patient stretches out as far as possible and brings the arms back parallel to the side of the body by describing a half circle in a vertical plane.

4. The head straight, arms extended at the sides of the head, bend the trunk forward at the hips so that the fingers, united by their palmar surfaces, touch the ground; return to the previous attitude with the arms in the same position.

5. The patient, standing opposite a wall and an arm's length from it, stretches out the arms horizontally in front, and applies the hands flat against the wall; without moving his feet the patient slowly



brings his body to the wall by bending the arms on the forearms, then he slowly recovers.

6. The patient stands straight, feet together, head straight; a rod or stick about four feet long is then grasped firmly by the hands about two inches or more from the ends and raised above the head, the hands still remaining the same distance from the ends. The rod is next lowered behind the back as far as possible. The hands must still retain their position on the rod, but the elbows must be bent. Alternately raise and lower the rod.

He reports four cases treated by the above method.

He concludes his paper as follows:

1. Fracture of the elbow occurs commonly in children.

2. Males are more frequently affected than females.

3. Acute flexion is the best position for all fractures of the elbow except fractures of the olecranon process. These latter should be retained at almost complete extension.

4. Passive motion, massage, and exercises should be given early, preferably beginning at the tenth to twelfth day and continuing until movements of the elbow are normal and free from pain.

5. Displacement of the fragments must be guarded against when passive movements are begun, as faulty reduction causes periosteal proliferation that may lock the joint.

6. Fracture of the head and neck of the radius, while not a common condition, occurs often enough to be considered while making a diagnosis of injuries to the elbow.

G. W. HOCHREIN.

**Hunkin, S. J.: Fractures of the Femoral Neck; a Plea for Optimism in the Treatment.** *Am. J. Orthop. Surg.*, 1918, xvi, 291.

Fractures of the neck of the femur are as amenable to treatment as fractures, within the joint, of any long bones, the author believes. And yet union in fractures, generally speaking, occurs in 95 per cent, while in fractures of the femoral neck union occurs in but 10 or 15 per cent. The difference is accounted for not by any peculiar physiological or pathological principles, but by mechanical principles alone.

The anatomy of the joint gives rise to difficulty of maintaining the parts in apposition. Due to the angulation of the neck and the shaft, displacement is rapid and to the capsular limit. Therefore chance of repair lessens with age since the angle of the neck increases with the weight of years.

The method of attempting to maintain apposition in a universal joint by splinting one surface of that joint is folly. The plan of maintaining the fragments in apposition by extreme abduction and hyperextension, as advocated by Whitman, presupposes a rotation of the femoral head from an angle with the shaft of 120° or 135° to 160° or 170°. The author's observations prove that such rotation generally does not occur. Necessity decrees the use of some device to bridge the diastasis between

the fragments. Any method which secures ready access to the diastasis and permits accurate adjustment of some bone, metallic, or any rigid splint between the fragments, is all that can be secured by any operative procedure.

External splinting after operation is of supreme importance. To obtain the best results from a splint, that splint must be firm, clean, easily adjusted, adaptable to the surfaces of the body, rigid, must control all surfaces of the joint, and have leverage. Plaster of Paris answers best all these requirements.

JOHN MITCHELL.

**Dorrance, G. M.: Treatment of Fractures of the Neck of the Femur with Special Reference to Whitman's Abduction Method.** *Penn. M. J.*, 1918, xxi, 551.

The points emphasized by the author are: (1) the need for a more accurate nomenclature in stating where the fracture is situated in the neck, as the treatment and results vary to a certain degree with the location; (2) the high mortality; (3) the great amount of morbidity (pain and inability to work); (4) advantages of Royal Whitman's abduction method associated with the internal rotation of Hawley; (5) cases where Whitman's method cannot be applied, i.e., cases of incontinence of urine or feces or where large herniae are present; (6) results of Whitman's method; (7) disadvantages and mechanical defects of extension methods.

E. B. FREILICH.

**Gray, H. M. W.: The Treatment of Compound Fractures of the Femur at Casualty Clearing Stations.** *N. Y. M. J.*, 1918, cvii, 1181.

Early operation is especially essential in compound fractures of the femur. If shock is pronounced, gas and oxygen is the anæsthetic of choice. For others, spinal anæsthesia with 1 ccm. of 10 per cent novocaine is preferred. If necessary, transfusion is performed before operation. The patient must be handled as little as possible, at least until anæsthesia is in effect.

A rope and pulley device is used for supporting the limb. If easily possible, both broken ends of the bone are made to protrude from the wound, thus lessening the likelihood of overlooking splinters and bits of septic material.

The superficial wound is excised; the presence of pockets is determined and all found are opened widely. The full extent of injury to the muscles and bone must be seen.

Amputation should be performed: (1) when the main vessels are divided and collateral circulation does not exist (unless anastomosis can be accomplished); (2) when gas gangrene is present in more than one group of muscles or in one so located that total excision cannot be carried out; (3) when either the main artery or vein requires ligation and gas gangrene already exists beyond the point of ligation; (4) when the sciatic nerve is hopelessly

destroyed; (5) when virulent sepsis exists in extensive wounds and the patient is in a bad condition.

A circular method is employed. Then the deep muscle fibers are sewn over the stump. Carrel's method or a pack are the desirable forms of dressing. Primary suture is risky; drainage should be provided for.

The usual principles of conservative treatment are in vogue. Wide excision of the superficial wound and all septic or devitalized tissues is done. Bone fragments unless completely separated are not removed. Perfect hæmostasis is essential; dead spaces must be obliterated. The surface of the wound may be rubbed with flavine or some other antiseptic paste. The wound is sutured and (if in doubt) drainage is provided for twenty-four to forty-eight hours. The limb is then immobilized on a Thomas splint, the application of which is described in detail.

LISTER TUHOLSKE.

**Francini, M.: Diaphyseal Fractures of War** (Fratture diafisarie nei feriti di guerra). *Chir. di organ. di mov.*, Bologna, 1918, ii, 41.

During his two years of service in a front Italian hospital Francini has treated 416 diaphyseal fractures, 85 of the arm, 77 of the forearm, 112 of the thigh, and 142 of the leg. There were 62 deaths. Of those recovered, 88 show mutilations, 46 of which are operative mutilations. In the author's service immediate amputation is never done; but only when indicated by gangrenous infective processes.

In the evolution of war fractures of the limbs, the greatest dangers are from shock, hæmorrhage, and infection. These reach their maximum gravity in femur fractures. The earliest and most important infection is that of gas gangrene, and the author's statistics with regard to this agree in general with the reports of other authors. It is a frequent and a very grave complication of compound fractures.

As regards the treatment by certain authors of exposed war fractures by osteosynthesis, Francini thinks that for any one well acquainted with the external means of immobilization, metallic fixture is quite superfluous, and that what is superfluous is almost always to be condemned.

All the amputations done in the author's hospital were for gas gangrene. With regard to the views recently expressed by some French surgeons who advocate early amputation in severe compound war fractures on account of possible complications and ultimate disability, Francini thinks that such a principle would be dangerous to adopt. What is needed is a greater application of conservative treatment. In the severe and rapidly ascending forms of true gas gangrene, however, conservative treatment must yield to immediate amputation, which has greater possibility of success the earlier it is done. The virulence and rapidity of dissemination of this process does not allow any limiting of the necrotic area, as in other forms of gangrene. The amount of limb sacrificed must be extensive and sufficient to leave little doubt of the result, al-

though it is not gratifying to the surgeon to make high amputations and to leave a stump of little value for prosthetics. Nevertheless Francini's ample experience with amputations for gas gangrene and the evolution of this process has convinced him that when one segment of a muscle is attacked, the whole muscle is involved. Short stumps are therefore necessary unless an amputation can be done in the thigh, the area of infection being limited to the leg. Not only is there a better chance of cutting off the infection on account of the distance, but the upper tissues are more resistant to the infection.

The selective muscular site of the infection does not give disarticulation any advantages over a high amputation. The operation done by the author has been a high amputation with lateral incision as in a two-stage disarticulation, which favors elimination of secretions and necrosed tissues.

Emphysema may in some cases be observed to extend above the limit reached by actual infection and the surgeon may even demonstrate the peculiar resonance characteristic of the process above the root of the limb, but such signs do not mean failure; even in such unfavorable conditions Francini and others have had successful results.

Circular amputation is preferred, carried out under ether anæsthesia.

Taking all the circumstances into consideration Francini considers his results of amputation in gas gangrene very good. In a first series of 29, most of them done in 1916, there was a mortality of 24 per cent. Of 25 amputations in the spring of 1917, 18 were lost but these were extremely grave cases; and these wounded did not reach him until after a very long delay because of military conditions. The author is unable to express an opinion on the ultimate results in the surviving cases.

W. A. BRENNAN.

**Frankau, C. H. S., Drummond, H., and Neligan, G. E.: The Successful Conservative Treatment of Early Gas Gangrene in Limbs by the Resection of Infected Muscles.** *J. Roy. Army M. Corps*, 1918, xxx, 608.

The experience of the authors corroborates the observations to which Cuthbert Wallace first called attention, viz.: (a) that gas gangrene has its initial focus in the injured muscles in all cases; (b) that the infection travels in a longitudinal direction in the muscles and there is little tendency for it to pass from one muscle to the other.

In view of these facts the authors resect the infected areas so as to arrest the infection in the muscle or groups of muscles involved. Resection is contra-indicated if the main blood supply of the limb is cut off. Resection should extend until muscle is reached which has the following characteristics: (1) unchanged color; (2) normal contractility; (3) a good blood supply, as indicated by free bleeding from the cut surface.

The treatment of cases after resection is carried out on the following lines: (1) reduction of dressings



to the absolute minimum; (2) constant or intermittent irrigation of the wound by some modification of the Carrel method.

The remainder of the article is devoted to a report of cases illustrating the clinical application of the principles laid down by the authors.

D. N. EISENDRATH.

**Wight, J. S.: The Treatment of Fractures.** *Am. J. Surg.*, 1918, xxxii, 119.

In children fracture should be differentiated from epiphyseal separation, coxa vara, tuberculosis, and osteomyelitis; in adults from coxa vara, arthritis deformans, tumor, malignancy, and osteomyelitis.

Wight has done away with bone plates and silver wire. Screws are used in long spiral fractures. Generally bone sutures such as chromic catgut in children and kangaroo tendon in adults is used when fixation is needed.

In fracture of the femoral neck Whitman's abduction method is better than Buck extension or long side splint. The best results are obtained with the bone peg and abduction in plaster. It is indicated in all operable unimpacted fresh fractures of the femoral neck in patients up to fifty years of age, and in operable ununited fractures. A fracture table is essential for the best results.

CARL R. STEINKE.

### SURGERY OF THE BONES, JOINTS, ETC.

**Brooke, J. A.: Fractures of the Tibia Following the Removal of Bone Graft.** *Am. J. Orthop. Surg.*, 1918, xvi, 399.

Three cases of fracture of the tibia from very slight injury occurring following the removal of bone grafts are reported. In each case the graft was cut by a motor saw and the tibia not split by a chisel in removing the graft.

In two cases the bone grafts were used for an ununited fracture of the radius; the third for the humerus. The incisions had healed promptly and there was no pain over this area, the patients being allowed to walk about at the beginning of the fifth week. Because of the fact that fracture of the tibia following the removal of a bone graft occurs after very slight injury, the need for support over a longer period than five weeks is necessary, the author thinks.

E. C. ROOS.

**Emerson, K.: Wounds of the Knee-Joint.** *Am. J. Orthop. Surg.*, 1918, xvi, 311.

Wounds of the knee-joint may be classified as to etiology into those caused by bullets and those caused by shell fragments. The wounds caused by rifle bullets and shrapnel ball are less destructive by far than those caused by shell fragments. In the latter type there is a greater amount of tissue tearing and usually more dirt and septic clothing is carried into the wound.

The author classifies the knee-joint wounds as to extent into: (a) wounds involving the capsule of the

knee-joint without fracture; (b) wounds involving the capsule with fracture of one or more of the bones entering into the structure of the joint; and (c) wounds of the bones of the joint, causing fractures into the joint but not involving the capsule. Under (a) and (b) he makes three subdivisions: (1) through-and-through wounds, with no foreign body in the joint; (2) wounds with a foreign body in the joint, free or embedded in bone or capsule; (3) wounds with a foreign body passing through the capsule and lodging in bone or soft parts, but quite outside the joint itself. Various combinations of these groups are met in multiple injuries.

The simplest wounds of the knee-joint caused by rifle or shrapnel ball are treated by splinting and rest. If the effusion is great, the joint is aspirated. Sepsis occurs in a few cases and the joint should then be opened, washed out, and closed. Through-and-through shell-casing wounds should be operated upon at once, especially if there is bone injury. Foreign bodies lodged in the joint or adjacent tissues should be removed.

In operating on the knee-joint a liberal excision of the skin and underlying tissues along the track of the wound is made. The foreign body if present is removed, which may necessitate a free incision of the capsule and a wide exposure of the joint. The joint is then syringed out with eusol, salt solution, Dakin's solution, weak corrosive, flavine, ether, or formalin. A half teaspoonful of bismuth-iodoform paste is then inserted. The clean-cut edges of the capsule are sutured with chromic catgut. The overlying tissues are either sutured loosely or left open to granulate. A temporary drain is left in to take care of superficial sepsis. The limb should then be perfectly immobilized either with plaster of Paris or with splints, and moderate extension should be secured.

The above technique is greatly complicated if there is extensive laceration of the capsule or especially by fractured bones. If the patella is greatly comminuted, its complete removal may be necessary. Free resection of wound tracks with gouge and chisel must be carried out in bone, and loose fragments in the joint removed. Foreign bodies embedded in bone should be removed. When the tibia is involved, comminution seems to be more extensive and infection is more prone to occur. Where other bones are also involved, severe tibial injury points to resection. Where the bone destruction is great, the choice lies between excision and amputation above the condyles. If the crushing extends some distance along the shaft of either bone or if the popliteal vessels are gone, amputation should be done. If the injury admits of a classical excision through practically uninjured bone, primary resection should be done.

In the after-treatment of these cases, extreme extension should be avoided. If the knee swells, aseptic tapings or a series of tapings are indicated. After the danger of infection has passed, motion, together with baths and massage should be instituted at the earliest possible moment.

Septic knee-joints may be opened, washed out, and sutured. This procedure is usually not sufficient and the alternatives are resection of the joint, drainage, and amputation. Resection of a thoroughly infected joint often causes death due to an already started osteomyelitis or general sepsis. If the joint is to be drained, free exposure is necessary. Carrel tubes should be introduced so as to flush completely every part of the synovial surface with eusol. Finally, the leg should be put in a Thomas splint with a fair amount of extension to separate the joint surfaces and to facilitate washing. E. C. Roos.

**Riely, C.: An Operation Which, in Selected Cases of Infantile Paralysis of Long Standing, Causes Return of Power in the Paralyzed Muscles; Report of Cases.** *Am. J. Orthop. Surg.*, 1918, xvi, 300.

Concluding from experimentation that the curves and projections of long bones act as levers in bringing about movements of parts at a distance and that in paralytic deformities abnormal positions interfere with transmission of power, the author devised an operation to overcome such abnormalities.

The operation consists in exposing the origins and insertions of muscles that are paralyzed or allow the greatest deformity, drilling a hole through the bones at these points, and passing paraffined braided silk through the holes and along the sheath of the paralyzed muscles, thus connecting origin and insertions. The silk serves to correct the deformity and permit the return of function in the overstretched or overrelaxed muscle. The operation is still in the experimental stage, hence the author is not certain when to remove the silk.

From the number of cases cited, results seem satisfactory.

JOHN MITCHELL.

**Taddei, D.: The Treatment of War Infections of the Joints in Interior Hospitals** (La cura delle infezioni articolari di guerra nell' ospedali territoriale). *Chir. d. organ. di mov.*, Bologna, 1918, ii, 103.

Taddei's opinions on war surgery of the joints are based on his extensive experience in one of the large Italian territorial hospitals. He reviews the various treatments in vogue for infected wounds, arthrotomy, synovectomy, typical and atypical resection, disarticulation, etc.

Arthrotomy, the operation most currently practiced for infected joint wounds in civil practice, has but few indications in war surgery. Its results are generally unsatisfactory, and Taddei has observed that amputations for infected joints were all in those who were primarily arthrotomized. The exposure of the infected surface is incomplete; removal of foreign bodies, bone chips, etc., is limited; and drainage is insufficient.

The Carrel treatment applied to articular infections treated by arthrotomy is useless, if not danger-

ous, because precious time is lost in trying to obtain a result which only more rational treatment can give. Arthrotomy is only indicated in cases where there is no retained projectile or where a retained projectile is easily accessible; but even then it is better to open up the tract by a classic incision. Arthrotomy when done should be associated with synovectomy.

After arthrotomy, atypical resection is most commonly done when there is a partial lesion of the articular head. It appears to the author to be inadvisable, as it has all the disadvantages of a typical resection and favors ankylosis.

Taddei thinks that typical resection has the most indications and gives a good orthopedic result, especially in those cases in which the projectile has caused a suppurative arthritis, with fracture of the articular heads. The technique of the resection should provide large incisions giving sufficient access; it should be subcapsuloperiosteal; the bone section ought to be limited as much as possible; if only one articular head is sectioned, the cartilage of the other should be removed to prevent its necrosis; if the incision does not suffice, a specially low drainage incision should be made, gauze drains rather than rubber tubes being used.

The postoperative measures advocated are: (1) complete immobilization in fenestrated plaster apparatus; the shoulder in abduction; the elbow at an angle slightly less than a right angle with abducted shoulder; the fingers in extension; the knee in extension; the ankle in flexion a little less than a right angle; (2) there should be as few dressings as possible, done only for pain, fever, bad odor, etc.; during a dressing it is well to apply an elastic constricting band above to compress the principal artery; blood loss from granulating surfaces is thus avoided; (3) the first dressings are always made under ether narcosis and the author attributes a part of his good results to this; the gauze drains ought to keep the superficial wound largely open; thick folds are preferable to long strips which favor fistulæ; (4) the immobilizing apparatus is removed when suppuration ceases and the temperature is normal for ten to fifteen days.

If in spite of treatment temperature does not fall, suppuration persists, and the patient is depressed and shows an intense albuminuria, amputation should be done. Taddei warns against the results of economic operations in infected joint injuries. Although slight intervention sometimes gives success, many are exposed to danger by this procedure. The fact that surgery of infected joints is difficult and delicate is not a reasonable objection for it to be avoided or insufficiently carried out.

W. A. BRENNAN.

**Zorraquin, G.: Osteoplastic Disarticulations** (Desarticulaciones osteoplasticas). *Rev. Asoc. méd. argent.*, Buenos Aires, 1917, xxvii, 1030.

Zorraquin describes his technique for osteoplastic disarticulation. He divides it into ten operative stages as follows:



(1) Skin of fascia incision; (2) muscular section and hæmostasis; (3) disarticulation; (4) diaphyseal resection; (5) plastic and osseous suture; (6) periosteal suture; (7) muscular and tendon suture; (8) suture of skin; (9) drainage; (10) immobilization.

The details of each step are described and illustrated. A circular section is preferred. The muscular mobilization must be sufficient for hæmostasis and disarticulation; it must permit resection of the diaphysis, as well as suturing over the displaced epiphysis those muscle groups the function of which is to be preserved. The diaphyseal bone resection is subperiosteal. Zorraquin's report does not refer to any particular articulation.

W. A. BRENNAN.

**Stassen, M.: Kineplastics and Prosthetics** (*Plastique et prothèse cinématiques*). *Arch. méd. belges*, 1918, lxxi, 657.

Stassen defines kineplastics as the art of modelling the bones and soft parts of amputation stumps so that an amputated patient can by means of his muscles and tendons voluntarily and directly govern the action of different segments of an artificial limb, thus approaching as far as possible the normal state. The method is especially of Italian origin, Vanghetti having been the first to publish the theory in 1898.

Although a large number of articles by Italian authors have been written, the question of kineplastic prosthetics has to a large extent been ignored by other European as well as American surgeons. According to Vanghetti there are combined in orthopedic surgery: (1) a static element of equilibrium; (2) a dynamic element of force; and (3) a cinematic element of motion. These three elements combine their effects in variable proportion according to the limb. In the lower limb the static and cinematic elements predominate; in the upper limb the dynamic and cinematic. An artificial leg ought to permit well balanced movements, while an artificial arm is called on to execute movements in which the subject can exert much force.

The extremity of an amputation is called a "plastic motor;" it is this motor which under the action of muscular contractions puts the different mechanisms of the prosthetic piece into play. Thus for instance in a forearm amputation, by suturing the extensor and flexor muscles end-to-end at the extremity of the stump and isolating them in cutaneous jackets, a contractile muscular loop is formed which allows the subject to direct the movements of an artificial hand.

The ideal in other methods of amputation had for its end the creation of a good anatomical stump alone. Vanghetti on the other hand tries to obtain a stump of maximum value physiologically, and toward this end the formation of the stump is an operation of several stages.

There are three fundamental types of plastic motor: the knob or club (*massue*), the loop (*anse*), and the knob-loop (*anse-massue*); but the form and number of motors vary infinitely. Thus Putti re-

cently in a hand disarticulation obtained excellent results by creating a diaphyseal nearthrosis, a veritable cinematic pseudo-carpal, at the extremity of the forearm, which could be moved by contractions of the flexor and extensor muscles. Putti also showed the latest progress and the wonderful results obtained in the prosthetics of the amputated following the kineplastic principles of Vanghetti. Stassen is surprised that these principles of Vanghetti have not received more attention than they have from surgeons in the allied armies, but he hints that perhaps this is due to the fact that there is not sufficient collaboration between surgeons and prosthetists. There should be no difficulty as regards amputations being made at the front, with the idea that the patients undergo later such operations as may be necessary for the creation of suitable plastic motors.

The functional re-education of the amputated is a problem which demands the co-operation of all concerned, and the surgeon at the front has not the least important part. Vanghetti's ideas ought to be taken into most serious consideration in view of the enormous number of mutilated who will be left at the end of the war. Stassen therefore pleads strenuously for special attention to the new applications of surgical science which will give those mutilated the best restoration of their functions.

W. A. BRENNAN.

**Vanghetti, J.: The Theory of Plastic Motors for Kineplastic Prosthetics** (*Sur la théorie des moteurs plastiques pour prothèse cinématique*). *Arch. méd. belges*, 1918, lxxi, 663.

Vanghetti states that although his theories have been published and well known for nearly twenty years, yet recently Sauerbruch published in Germany a book on the subject of kineplastics in which this author gives to a Swiss engineer the credit of having originated the method during the present war, thus showing himself ignorant of the Italian, French, English, and even some German literature on the subject.

According to Vanghetti, every kineplastic operation is based on this principle of muscular limb surgery: that the limb is a collection of individual muscles which according to the circumstances are capable of functioning alone or of being substituted, either alone or combined, for others among themselves which have for any cause been eliminated; and that such substitution may happen even in cases where the functions are anatomically opposed. The principle is that in an amputation or disarticulation a tendon or muscle with physiological protection can serve for kineplastic prosthesis when it is attached to an apparatus.

The author explains practical kineplastics and the formation of plastic motors in the stump. Such a motor may be terminal, lateral, or extra-segmental, according to its position on the stump. There are three types; the loop, the knob, and the loop-knob. The knob is a thickened protuberance which is

formed on the extremity of muscles, tendons, or aponeurosis, and above which a ring or other fixture can be applied to exercise traction on the prosthetic apparatus. The loop is a natural or artificial reunion of tendon, muscle, or aponeurotic branches in such a way that a space is formed in which a lace can be inserted. Each method has its advantages and disadvantages.

He states the principle that if there are two muscles with possibly antagonistic reciprocal actions united either in a loop or knob, it is possible to communicate a double alternative movement to the prosthetic apparatus from a single point of attachment. Thus plastic motors may be either unimotor or plurimotor.

Vanghetti discusses the advantages and disadvantages of muscular, tendinous, and aponeurotic plastic motors and arrives at the conclusion that the alternating tendon and aponeurotic loop is at present the ideal motor. He gives a number of schematic figures explaining various types of plastic motors. With regard to amputation with the impossibility of further surgery after the incision, he thinks that in general the amputation of Celse is best adapted to kineplastic surgery.

W. A. BRENNAN.

**Pellegrini: The Technique of Kineplastics** (Contribution à la technique de la plastique cinématique). *Arch. méd. belges*, 1918, lxxi, 675.

Pellegrini describes the technique of kineplastics, with or without re-amputation and shortening of the stump. It consists essentially in incision of the skin and subcutaneous tissues in the vicinity of the stump extremity, mobilization of the tendons and muscles, and their formation into a motor with the necessary cutaneous plastics.

Four variations in the execution of this technique are described in detail and illustrated with several figures. Those interested should consult the original work, as it does not lend itself to an abstract.

W. A. BRENNAN.

**Pieri, S.: Kineplastic Amputation in War Surgery** (L'amputation cinématique dans la chirurgie de guerre). *Arch. méd. belges*, 1918, lxxi, 688.

Pieri writes of kineplastic amputation from the viewpoint of the military surgeon. He thinks the method finds its greatest indication in cases of mutilation of the upper limb. In war surgery the problem may present itself as a question of primary, secondary, or tertiary kineplastic procedures. The injury may be such that it calls for immediate amputation, in which case a kineplastic amputation will be done. Pieri however thinks that this is in general impracticable and that the primary operation should only be one which favors a later secondary operation.

In this primary operation no attention is given to regularity and symmetry preserved at the expense of healthy tissue. As much of the skin as possible is preserved. The bone is cut above the

level of the retracted soft parts and sutures are avoided. The stump is subjected to rigorous intermittent antiseptic irrigation to avoid suppurations. When the evolution is normal, traction is applied to the soft parts in order to prevent muscular retraction and to obtain a stretching of the skin strips.

While these are the general rules, special post-operative treatment is applied according to the type of mutilation and the part amputated. The author describes these measures for the shoulder, arm, elbow, forearm, and hand.

Tertiary kineplastic operations are done in cases where the primary amputation was done according to the classic procedures. The different modes of effecting this, practiced by various surgeons, are referred to. Generally it is advantageous to do a tertiary operation, as the area worked in is aseptic and there is an abnormal disposition of the muscles, etc., which can be taken advantage of. The more recent the amputation the better, before any of the muscular tissues have become subject to atrophic changes. Pieri details the procedures for the different regions and gives a number of photographs of results obtained in his war work. W. A. BRENNAN.

**Putti, V.: Kineplastic Amputations.** *Lancet*, Lond., 1918, cxciv, 791.

The medical literature of Italy, Germany, and Austria amply discusses the fundamental theories of "kineplastic amputations" which were so ably brought forward by Giuliano Vanghetti, the original exponent of these principles, but the French, English and American literature contains very few if any allusions to the subject. In 1896 Vanghetti first conceived the idea of conserving the functional resources of the stump so as to convey movement to the artificial limb. He wrote and published many articles on what he had named "kinematic amputation," but was prevented from putting his theories into practical application so that prior to the present war the number of cases of kineplastic amputations did not exceed twenty.

The word kinematization is applied to the active mobilization of such muscles as are involved in amputations with the idea of later vitalizing the artificial limb. Motor flaps are formed of the muscles and tendons which may act independently of the stump, and may be at the end (terminal) or in the continuity of the stump (extraterminal). Motor flaps are more easily formed in the upper limb and this therefore has more frequently been kinematized, but the number of successful cases of kinematization of the lower limb is increasing.

The application of kinematization upsets all ordinary methods of amputation. There must be preserved the greatest possible amount of bone as well as the motor masses and integuments. Skin flaps, muscular insertions, various bone and tendinous fragments which would seem utterly superfluous under ordinary circumstances for the preparation of ordinary stumps are to be considered of the greatest value in kineplastics. In many in-



stances on the battle front it is impracticable to perform primary kineplastics, but in such the retraction of the softer tissues must be guarded against so that a subsequent application of the principle may be successfully carried out.

A motor flap must (1) possess every requisite for withstanding a firm, resisting and painless grip, also a traction that sometimes attains a high degree; and (2) it must be provided with a sufficient amount of functional muscular tissue to guarantee the accomplishment of the task that will be demanded of it. The flap must be covered with skin in perfect condition, well nourished, and provided with a normal degree of sensibility. It must also be of suitable size for the fastening of hooks, wings, and rods that are destined to transmit the functional movement of the artificial limb. As the tendon is the element best adapted for the transmission of the muscular contractions, it must be largely used for the formation of the terminal motor flaps, or by tunnelizing the muscular masses extraterminal motors are formed.

In order to supply such materials as may be missing *in loco* recourse may be had to the numerous methods of transplantation of skin, muscle, aponeurosis, or bone. Arthroplastics, with interposition of aponeurotic flaps, may render stiff and ankylosed stumps usable. The difficult prosthetic problem of gaining power over the knee-joint has been solved by successful kinematization of the quadriceps; also the carpal stumps, the very short forearm stumps, and the disarticulation stumps are capable of good functional movements due to kineplastics.

The action of the flexor and extensor muscles of the forearm may be transmitted to the artificial limb by means of metal rings covered with vulcanized rubber. These are placed at the ends of the finger-like motor flaps and gradually tightened until held firmly, to which the fingers of the artificial hand are attached. In another type of motor flap the tendons of the flexor and extensor muscles are brought together in such a manner as to form a ring or loop which is covered with skin, through which a rod is placed to be attached to the artificial limb. Experience has proved that if the motor flap is well placed, if the skin that covers it is healthy, and if the wounds are absolutely healed, neither the rings nor the rod cause the slightest pain nor do the least harm. The ring is supplied with a screw by which the injured man may regulate the pressure on his finger-like motor flap. The rod should be removed at least once in twenty-four hours in order to clean it with alcohol and lubricate it with vaseline.

The sensibility and muscle sense of the flap when first made is greatly altered but improves upon use until even a keener sense than normal is developed. The patients best adapted for this class of procedure are those between twenty and thirty years of age, who are intellectually keen, and can adapt themselves to their newly formed members. Diligent training is required to cultivate the muscles to

accurately and untiringly take up their new work. It is essential that the artificial limb be suitable for the stump and for the work demanded of it.

While the idea of kinematization is twenty years old, yet it took the present war to bring out its development. Prior to this the Italians had used it almost exclusively. Lately the Germans have created an admirable scientific organization, but have contented themselves with the development of a single type of motor flap although the possibilities have been proven to be much greater.

The author concludes that:

1. Kineplastics are entitled to be placed among the most brilliant of the discoveries of orthopedic surgery, deserve to be accepted with confidence, and tested on a large scale by those whose aim it is to restore to the disabled man his functional activity.

2. The preparation of motor flaps is a well defined surgical act that must be performed in accordance with its own technique, the methods of which have already stood the test of experience.

3. Motor flaps are capable of giving both the quality and quantity of action determined by their muscular masses that actuate them, yet the artificial limb must fit perfectly and be of the proper strength.

4. The surgeon and the mechanic must work in harmony to satisfactorily solve this interesting and difficult problem of vitalization of the artificial limb.

P. W. SWEET.

**Yergason, R. M.: Tendon Transplantation to Stabilize the Hip-Joint.** *Am. J. Orthop. Surg.*, 1918, xvi, 323.

As a substitute for the paralyzed gluteus maximus muscle, the author offers the substitution of the semimembranosus in order to stabilize the hip-joint. The size of the tendon of the semimembranosus, its strength, and the short distance between its attachments serve to prevent stretching.

By way of preparation a plaster-of-Paris cast is made of the leg extending from the toes to the nipples. This cast is so as to form an anterior and posterior splint. With the patient supine in the anterior half of the cast, and the posterior removed, the operation is performed.

An incision in the median line of the posterior aspect of the thigh is made from a point slightly above the gluteal fold extending downward three or four inches. A second incision is made just behind the upper end of the shaft of the femur on the outer aspect.

Through the first incision the operator finds between the long head of the biceps and the semitendinosus the tendon of the semimembranosus. This is freed by blunt dissection as far as possible beneath the long head of the biceps and as far down as the point at which it joins the muscle.

Through the second incision the operator draws aside the biceps and drills a hole from without inward and upward through the gluteal ridge of the femur just anterior to the gluteus maximus.

The freed tendon of the semimembranosus is then pulled through the hole in the femur and sutured to itself. The cut fleshy belly of the semimembranosus is sutured to the belly of the semitendinosus and both wounds closed. The posterior half of the cast is then applied.

Upon recovery a certain amount of adduction and abduction are possible, although the patient must sit without flexion of the hip.

JOHN MITCHELL.

**Caforio, L.: Free Adipose Transplant as a Method of Filling Bone Cavities** (Sui trapianti liberi di adipe quale mezzi di impiombatura delle ossa). *Riforma med.*, Napoli, 1918, xxxiv, 182.

The author states that only 45 cases of fat grafts used to fill bone cavities are reported in international literature. Only 16 of these were followed by positive results. He reports a successful case which he believes is the first attempt in Italy to fill with fat a large cavity.

The patient was a wounded soldier, the middle third of the tibia having been badly fractured by a shell. As the wound did not heal after several months and showed a fistulous tract terminating in an osteitic cavity, the author determined to clean out the cavity and to fill it with a free autoplasmic fat graft. After opening up the fistulous tract and completely curetting the cavity, a piece of fatty tissue about the size of a mandarin orange was removed from the right buttock. This was gently inserted into the bone cavity, taking care that it was in good contact with all recesses without traumatizing it. A rubber drainage tube was placed with posterior contra-aperture, and the wound closed. The man made a rapid and excellent recovery; 43 days after operation there remained only a few granulating islets to be epithelialized. The patient may be considered as completely cured, without the least trouble in locomotion.

The author reviews briefly the literature. He has made a number of experiments on rabbits to test the action of fat grafts in filling cavities, and their ultimate fate. The site selected for experiments was the superior tibial epiphysis. In this region the periosteum was carefully stripped open and the bone hollowed out without producing a fracture. The cavity was then filled with fat tissue removed from the inguinal region of the same animal, over which the periosteum was again sutured with very fine silk. Eight such experiments were made, the animals killed, and the site of the transplant carefully removed. The details in each case are fully given.

The study of the microscopic preparations from these experiments, while it does not give wholly uniform findings, gives two important conclusions: (1) that the fat graft does not remain *in situ* as such; (2) that it is totally substituted by a new osteoid tissue.

It is of great interest to surgeons to find that there is a definite replacement of the graft by bone. While

Makkas had noticed that the osteogenetic process was extremely slow, yet in Caforio's cases there was no trace of the transplant twenty-three days after operation. Caforio gives two reasons for this rapidity of action in his cases: (1) the species of the animal, bone regeneration being very rapid in rabbits; and (2) the size of the cavity filled. In Makkas' cases the cavity was the size of a cherry or of a nut; in Caforio's, the size of a pea.

There can be no question of the elimination of the graft in these experiments. The author, from the manner of healing, placed all doubt aside as to complete resorption of the graft. The experimental and clinical results lead him to conclude that fat grafts are absorbed and replaced by bone tissue; and that as a matter of practical surgery such grafts should be of immense service, especially in the many cases arising out of the present war.

W. A. BRENNAN.

**Margarit, F.: A New Method of Section or Resection of the Superior Extremity of the Tibia** (Nuevo procedimiento para la seccion o reseccion de la extremidad superior de la tibia). *Gac. méd. Catal.*, Barcelona, 1918, lii, 44.

Margarit had a case of genu valgum in an adult on which various procedures had been previously tried without any satisfactory result. In this case the deformity was due to a strong outward deviation of the leg which did not depend on any alteration in the direction of the femur nor of the glenoid surfaces of the tibia; there was a strong incurvation of this bone alone, the central point of rotation being scarcely three or four centimeters from the superior articular surfaces.

Having found no satisfaction in any of the classical methods, Margarit made cadaver experiments and devised the following, which he carried out on the patient: The skin, fibrous tissues and periosteum were incised and the latter turned back; the bone was cut beneath the articulation and then placed in correct position so that it could be calculated what amount of excess bone should be removed in correct alignment. This bone wedge was then sawed out, and the periosteum and the tendon sutured, after hæmostasis. The limb was immobilized for two months, then subjected to passive and active movements. An excellent result was obtained. The author discusses whether the section of the bone ought to be horizontal or oblique for certain cases.

W. A. BRENNAN.

## ORTHOPEDICS IN GENERAL

**Jones, R.: The Problem of the Disabled.** *Am. J. Orthop. Surg.*, 1918, xvi, 273.

Today in England wounded and disabled men form a large and serious proportion of the population, and they must be helped to remain an essential part of the economic man power of the nation, independent producers and wage-earners, and not helpless dependents.



Fully 50 per cent of the wounded men in this war suffer from injuries, the proper treatment of which depends on the employment of methods commonly adopted by orthopedic surgeons.

Orthopedic centers have been founded in various parts of England, and as far as possible, have been manned with young surgeons who have sufficiently flexible minds to keep pace with, and improve modern methods. They are trained to do the most delicate operative work, but also trained to recognize the possibilities of recovery without recourse to operation. Each center is designed so that every special department is represented, and each is presided over by a specially trained surgeon.

Orthopedics in relation to military surgery is the treatment by operation, by manipulation, by reconstruction, and by re-education of disabilities to arms and legs arising from injury or disease. The orthopedics of the war may be divided into: (a) preventive, and (b) corrective. The latter group of cases occupy the energies of the surgeons at home. The choice of treatment must be determined by many unexpected factors if the patient is to resume his ordinary life or desires a new calling. He must be consulted in the matter.

Curative workshops are to be found in all the centers, the governing principle in regard to curative work being founded on the well-grounded belief that active movements, which mean voluntary movements, are of infinitely greater value than passive movements in the mobilizing of joints. The exercises practiced in these workshops are of two kinds, the direct and the indirect. The direct curative work has often to be especially devised. A screwdriver may be employed to supinate the arm. In the indirect method, a stiff ankle may be unconsciously used when sawing wood.

The surgeon is now able to think in terms of function, and is not forced to think in terms of merely saving life. The suitable cases should be brought directly to these centers from the front, in order that deformity may be anticipated and prevented.

The men discharged from the hospitals either rejoin the army or enter civil life as pensioners.

The primary function of a military hospital is to send men back to the army. A recent analysis shows that 75 per cent of cases are returned to the army.

The patients discharged from orthopedic centers to civil life are divided into two groups, consisting of: (1) partially disabled, who require further treatment of an orthopedic kind; and (2) those who require a certain amount of treatment of a general kind. The pensions authorities follow up each patient after his discharge into civil life and supervise his further treatment. Pensions hospitals are essential unless the out-patient departments are affiliated with the orthopedic centers.

An out-patient department should be provided for out-patient treatment where massage, electrotherapy, and hydrotherapy can be obtained.

Facilities for re-education and training should be at hand. Employment bureaus should be established for these pensioners and every effort made to get them into a suitable and profitable industry.

E. C. ROOS.

**Sgobbo, F. P.: The Action of X-Rays in the Formation of Bone Callus** (Azione dei raggi X nella formazione del callo osseo). *Riforma med.*, Napoli, 1918, xxxiv, 282.

The author gives the details of 8 experimental studies to note the effects of X-rays in the healing of fractured limbs of dogs.

The only work along this line which the author is able to trace is that of Cluzet and Dubreuil, who in 1913 found by experiments on dogs that strong X-ray irradiation made before and after fracture notably retarded the formation of callus and consolidation of the fracture. Sgobbo's researches have in every way confirmed these findings; while with strong doses alone Cluzet and Dubreuil saw a retardation in the consolidation and formation of callus, Sgobbo by using minimum varying doses obtained, according to the dosage, retardation, limitation in the development, or even absence of callus. Even a single minimum dosage has effected retardation. The question as to whether the dosage of X-rays used in practice for radioscopic or radiographic research gives a similar result is now being investigated by Sgobbo; also the manner in which the harmful action of X-rays is exerted on the various elements concerned in the formation of callus.

Twenty-two illustrative figures accompany the article. W. A. BRENNAN.

**Newman, R.: The Treatment of Flat-Foot.** *N. Y. M. J.*, 1918, cvii, 978.

Flat-foot is a flattening of the arch usually with abduction and eversion of the foot. All those conditions which induce a disproportion between the weight of the body and the strength of the muscular and ligamentous tissue, diseases and injuries which alter the relation or shape of the bones, tend to produce flat-foot. The commonest causes are: improperly fitting shoes, prolonged standing, rapid increase in weight, general ill health, prolonged disease of the foot resulting in muscular weakness, infantile or other forms of paralysis, rickets, Pott's fracture, and arthritis of gonorrhoeal origin.

The author reviews the well known symptoms of flat-foot. He states that in static cases due to disproportionate weight, the application of a flat-foot plate, massage, electricity to strengthen the muscles, and exercises are indicated. The plate should be removed when the symptoms have disappeared. Rest in bed and later the application of a plaster cast is beneficial when the foot is too tender for the use of a plate.

Where eversion is well marked, a steel bar running up the outer side of the leg and supplied with a strap which passes around the internal malleolus

and pulls the ankle out should be applied. Plates and supports are useless unless the deformity can be corrected. If the foot is fixed in deformity, an anæsthetic may be given and the deformity overcorrected with the hands or a club-foot wrench, and a plaster cast applied.

Paralytic cases are treated by transplantation of tendons. The peroneus brevis is passed under the tendon achillis and attached to the scaphoid, and the peroneus tertius is attached to the same point after being passed beneath the anterior tendons.

The extensor longus pollicis or the tibialis anticus may be passed through a hole bored in the scaphoid and turned back to be sutured to the periosteum.

When the condition is osseous, a wedge of bone may be removed from the inner side of the tarsus. Osteotomy of the neck of the os calcis and astragalus, removal of the scaphoid, supramalleolar osteotomy, longitudinal section of the os calcis with displacement downward of the posterior fragment, all have been resorted to with reports of success in several cases.

E. C. ROOS.

## SURGERY OF THE SPINAL COLUMN AND CORD

**Ware, M. W.: Contracture of the Bladder Due to Spinal Injury.** *Ann. Surg.*, Phila., 1918, lxxvii, 533.

The author reports a case of spinal fracture with subsequent contracture of the bladder cured by laminectomy. November 9, 1916, the patient fell from a ladder, sustaining fracture of both ankles, and was removed to the hospital six hours later. Retention necessitated catheterization the following morning, and thereafter for six weeks. There was no paralysis of the limbs; X-ray of the spine was negative. The fractured ankles healed well in a cast. Retention gave way to true incontinence.

The author was first called to see the case on January 5, 1917. The patient was greatly emaciated; temperature was 102°, pulse 102. Urine was painfully voided, foul smelling, and mixed with blood and pus. The bladder was very tender. There was spasticity of the muscles in the left half of the abdomen and the lumbar region. No anæsthesia, paralysis of the limbs, or loss of reflexes was observed at this time. The possibility of spinal fracture was entertained as a cause of the isolated bladder disturbance. A permanent catheter was not tolerated.

Treatment consisted of bladder irrigations, and in a few days suprapubic cystotomy. The bladder wall was half an inch thick; the capacity was barely 30 ccm. The patient's general condition improved, and in two weeks the urine cleared and the drain was removed. An indwelling catheter was then tried to bring about complete closure of the wound, which occurred in one week. The patient, however, could not retain the smallest quantity of urine for any length of time, and in sleep was incontinent. Urination was no longer painful. The bladder could be distended to 60 ccm.

Four weeks after operation the patient was up, able to walk, and gained in weight. Examination showed marked tenderness over the dorsolumbar region of the left side, and a slight kyphosis embracing the last dorsal and upper lumbar vertebræ. A small butterfly-shaped area of anæsthesia in the anal fold extended forward to the scrotum. There was no dissociation of heat and pain sensation; also an absence of cremaster reflex, and slightly increased left patellar and left abdominal reflexes. X-ray, particularly the lateral view, showed compression

fracture of the bodies of twelve dorsal and one lumbar vertebræ. Operation was advised for possible relief of the pressure.

Laminectomy was done February 3, 1917. The spinous processes and laminae of the twelfth dorsal and the first, second and third lumbar were removed down to the articular processes. Pulsation of the cord was perceptible through the dura. On opening the dura the cord was seen to be angulated, corresponding to the altered position of the fractured vertebræ, the height of the angle being at the level of the first and second lumbar vertebræ, corresponding in the cord to the location of the conus. There were no hæmorrhages in the cord and no excessive amount of spinal fluid; the pial vessels were normal. No injury to the nerve roots was visible, and no loose fragments of bone.

Instead of resuturing the dura, a fascial graft was interposed. Retention now set in, therefore the patient was catheterized with daily irrigations. On the third day the suprapubic wound opened. The patient was discharged four weeks after operation, able to walk freely and to void small quantities of urine. There was no postoperative paralysis of the limbs or the rectum nor undue abdominal distention. A complete return of urinary function occurred one year later. The sexual function continued normal.

The summary calls attention to the prominent dysuria, due to a spinal fracture which escaped early detection. Subsequent radiograms at the correct level gave positive findings. The phases of dysuria were exhibited in a manner and sequence characteristic of spinal cord injury, first, with atony, attended with overflow incontinence; then true incontinence without ardor urinæ; and finally the hypertonic bladder. Operation relieved all urinary disturbances. The author believes this case to establish beyond any doubt that bladder innervation centers in the conus.

E. A. PRINTY

**Brackett, E. G., Mixter, W. J., and Wilson, J. C.: Operative Treatment of Fracture of the Spine Uncomplicated by Cord Injury.** *Ann. Surg.*, Phila., 1918, lxxvii, 513.

The object of the study which has been made in the series here reported is to determine by a com-



parison of the results, in non-operative and operative cases, whether it is advisable to recommend operative procedures in cases of fractured spine; and if so, in which cases and when. Both fresh and old cases have been included. The cases have been studied with reference to the types of injury to the spine, the period of partial or permanent disability, and the symptoms which accompany it, as well as the effect of the mechanical treatment by fixation and support. The prolonged disability in cases of fracture of the spine has been mentioned by many authors, but the treatment advocated has been conservative and mechanical in a very great majority of cases.

The cases in this series include only those which had no or only temporary nerve symptoms, and in which the repair of the spinal column alone was in question. Twenty-seven cases of fracture were studied; of these 10 were of the dorsal and 17 of the lumbar spine; and of this total number, 9 were operated upon. The character of trauma varied greatly. Disability because of pain was immediate in all except one. Severe local pain and tenderness were constant factors. Pain referred down one or both thighs was frequent, and occurred in a large proportion of the lumbar fractures, while in those of the dorsal the pain seemed more commonly to be local. Tenderness over the point of fracture was found in every case, and the symptoms were all largely relieved by recumbency. The presence of deformity was practically constant, kyphosis predominating. The motions of the spine were limited and attended by muscle spasm and pain, except in a few with abnormal mobility at the site of fracture.

Twenty-two of the series received mechanical treatment by recumbency and support. Of these, 4 recovered, i.e., they were free from pain, and able to return to the same or a similar occupation, and 18 showed persistent partial disability. Of the 9 cases operated upon, 3 were old fractures, and 6 were fresh, all of which show recovery, the time varying from three to six months. Operation consisted of a bone graft, inlaid in the split spinous processes, extending two vertebrae above and below the site of fracture. In the graft of the fifth lumbar vertebra the method of splitting the sacral part of the graft was used. No attempt was made in any of the cases to correct the position or diminish the knuckle. These cases were kept recumbent in a plaster shell or jacket for two months after operation, and a plaster was worn for the next four months of ambulatory treatment.

The authors suggest operation in cases which show the following conditions:

1. Fresh fracture: (a) crushed fracture of the bodies of one or more vertebrae associated with disalignment of fragments, particularly with involvement of any part of the laminae; (b) fracture of the fifth lumbar of any part, but particularly with involvement of the laminae; (c) fracture of body showing increasing knuckle, abnormal mobility at point of fracture, or complicated with rupture of the supra- or interspinous ligaments.

2. Old fracture cases which show persistent disability, as evidenced by inability to work, accompanied by continuance of pain, local or referred, and with general back weakness.

It is possible that the extreme degree of and the persistence of the disability with simple crushed fracture of the body of the vertebra may in part be due to the loosening of the anterior ligament or to the loosening of the intervertebral disks from the vertebral surface, with a rupture of the capsular ligament, and failure to firmly unite again.

Grafting should not be performed for two or three weeks after injury in order to allow the hæmorrhage to subside. It should not be done in fractures where there is a probability of crushed cord, or other extensive neurological lesion. E. A. PRINTY.

**Allan, W., and Squires, J. W.: Spondylitis Chronica Ankylopoietica.** *South. M. J.*, 1918, xi, 373.

The authors discuss two cases of spondylitis chronica ankylopoietica and review the literature as to the classification of spondylitis, mentioning the advantages of X-ray and physical examination of these cases. A complete history of two cases, with their symptoms and physical findings, is given. X-ray pictures of conditions of the spine are shown.

Causes of the various types of spondylitis they state are due to: (1) infection; (2) anomalies of the glands of internal secretion; (3) loss of elasticity of intravertebral discs; (4) auto-intoxication; (5) various other causes.

They believe that Baker's classification of the types of spondylitis is the best and clearest; it is as follows: (1) gouty arthropathics; (2) those of severe nervous diseases; (3) hypertrophic arthropathics; (4) chronic arthritis secondary to infection; (5) chronic primary progressive polyarthritides.

They were unable to find any causes of infection in their two cases and treated them only by protective measures. C. C. CHATTERTON.

## SURGERY OF THE NERVOUS SYSTEM

**Cone, S. M.: Surgical Pathology of the Peripheral Nerves.** *Brit. J. Surg.*, 1918, v, 524.

The author has investigated the gross and histological changes in more than two hundred cases of nerve suture in the Alder Hey Hospital which is in charge of Sir Robert Jones. The object of this

painstaking research was to solve the problems of nerve regeneration in war injuries of the peripheral nerves. These nerves are ready to unite at both ends of the injury before the end of eight months.

The nerve-bulb, found at the end of the proximal segment, distal segment, on the side of a nerve, or

as a cylindrical enlargement of the trunks, is the place where one may expect to see the most prolific growth. The same kind of growth and appearance is found here as is seen on the ends of nerves of amputation stumps.

It has been a difficult matter to convince many that there are fully formed nerves in either end-bulb. Now it is scarcely questioned that these nerve callus masses are full of nerves containing axis cylinders. The gross appearance of these wildly growing, coiling, twisting nerves is that of dense scar tissue. It is grayish-white, hard, nodular, and commonly seen at the ends of nerve-trunks.

In all of the author's sections of nerve-bulbs there was more nerve than connective tissue; as a rule they consisted of three-quarters nerve and one-quarter connective tissue and vessels. The microscope demonstrates the homogeneous mass to consist of interlacing fasciculi of young nerves, the fasciculi varying in size from 10 to 50  $\mu$  in diameter. The nerves making up these small bundles are young varicose fibers 1 to 3  $\mu$  in size.

There is practically complete unanimity of opinion that regeneration occurs in the distal end of a divided nerve, but nerves grow best from the proximal end. The author has demonstrated four methods of connecting the distal with the central or spinal fragment, thus giving the embryonal nerves an opportunity to mature: (1) by neighboring nerves, torn at the time of the original injury; (2) by a strand of undamaged, overlooked nerve still connecting the central and peripheral stumps; (3) by nerve fibers which have worked their way through the scar; (4) by adhesions carrying nerves around or bridging the scar.

The grayish-pink pulpy (gelatinous) appearance of the cross-section of a nerve is due to vascular, protoplasmic, much nucleated material in the small nerve-bundles; it means nerve regeneration. The denser grayish-white sections dotted with gray or grayish-pink points signify regeneration of young nerves; they have reached a fuller development than in the more pulpy areas. Constricting scar is particularly damaging when circular. Nerves pulled aside by bone callus or adhesions always contain well-developed fibers. Adhesions, middle-zone scar, and surrounding injured nerves are means of keeping the distal segment alive. The old degenerated nerve fibers form the best conducting paths for the growth of young tendrils.

There are certain influences causing nerves to grow and take a definite course. Nerves grow well in granulation tissue because the blood-vessels act as a scaffolding along and within which nerves grow. Nerves also grow well in fascia lata and in fact better than in muscle. There is a strong attractive force termed neurotropism exerted by one nerve upon another growing nerve.

The scar that is said to be the *bête noire* of the surgeon is between the ends of the severed nerves. The author finds it no different from any other scar tissue except that it seldom becomes sclerotic.

Densely-growing tissue of any kind makes it difficult for a nerve to pass through. Nerves may be turned aside when their ends reach an already prepared buttress. It is quite natural that unless the nerve fibers have grown *pari passu* with this connective tissue, an entering wedge will be next to impossible; it must be made when the tissue is young, cellular, and vascular. At that time the injured nerve was beginning its growth also. It was in granulation tissue, with many branching, irregularly coursing blood-vessels. These vessels directed its way, and the new tendrils following the capillaries, there being no stronger force such as the chemotropic influence of an opposite nerve stump to attract it. Finally it may reach the old gap, but conditions now, at the end of weeks or months, are very different. Instead of a loose, vascular, cellular tissue, there is firm, dense, connective tissue. The nerve may perchance follow a vessel into this, and send a few young tendrils into the scar. The chances are that the wild, turning, twisting, spiral course it had already followed, for the most part under the influence of the capillary blood-vessels, will now be exaggerated. A bulb results. It is not due to lack of ability to grow that the nerve-bulb forms. It is rather due to its excessive hardihood. It coils when it cannot pass the block. Nerves are invariably seen in painful scars.

Altogether this is one of the valuable contributions to the surgery of the peripheral nerves which the present war has brought out.

D. N. EISENDRATH.

**Heekes, J. W.: A Case of Prompt Recovery After Nerve Suture.** *Brit. M. J.*, 1918, i, 507.

The author states that his reason for recording this case is because of the early return of practically all functions in a severed nerve. In this patient the internal condyle of the left humerus and part of the olecranon process of the ulna were smashed. Sensation was lost over the cutaneous distribution of the ulnar nerve in the hand, both front and back. He could not flex the little finger and only very slightly the ring finger.

Six weeks later an operation was performed for sepsis and removal of sequestra. Subsequent X-ray showed three foreign bodies still left in the forearm. Six months later an operation was performed for repair of the nerve. Incision was made over the internal condyle. The nerve was exposed above and below the joint and found to be severed in the region of the internal condyle, and the ends, which were slightly clubbed, were separated for one and a half inches with intervening scar tissue. Electrical stimulation showed slight response in both ends. The ends of the nerve were cut off as squarely as possible, approximated with fine catgut sutures, and surrounded with Cargile membrane. Three days later the patient had sensation returning to the fourth and fifth fingers. On the sixth day sensation had increased over the entire distribution of the



ulnar nerve, and flexion of all fingers was quite good. A month later sensation had completely returned and his grip had grown stronger every day.

The earliest previous recovery known to the author was ten days and it usually requires three months to two years for a complete return of function. In this instance it is possible that some nerve fibers might have been present in the one and a half inches of scar between the two severed ends of the nerve which prevented complete degeneration of the distal fibers.

P. W. SWEET.

**Guillain, G., and Barré, J. A.: Gunshot Lesions of the Cauda Equina** (Les lésions de la queue de cheval par projectiles de guerre). *Bull. et mém. Soc. de chir. de Par.*, 1918, xlv, 272.

From July to December, 1916, the authors received in their neurological service 225 cases of true or supposed spinal cord lesions and traumatic paraplegias. Of these patients 138 have died and 87 have been evacuated. In the 225 cases the authors found 32 cases of lumbar and sacral wounds, in 10 the cone and epicone were injured at the same time as the umbar and sacral roots. There were 22 wounds of the cauda equina. Of these latter cases, 15 have been evacuated and 7 resulted fatally.

Wounds of the cauda equina are unquestionably milder than true wounds of the spinal cord; but nevertheless the prognosis is not very favorable, as they have shown a mortality of 31.8 per cent. In the fatal cases the authors have often remarked that there were few splinters but a large loss of bone substance. The projectiles were large and frequently embedded in the anterior wall of the posterior face of the sacrum. In the recovered patients there were almost always numerous bone splinters and the projectiles were not deeply embedded. Of the 15 recovered cases, 14 were injuries of the cauda equina by lumbar wound and in only one case was the wound sacral. In the fatal cases 4 were lumbar and 3 sacral wounds. In 9 of the recovered cases the dura was intact. In the 7 fatal cases the dura was opened. The opening of the dura in lesions of the cauda equina is a factor of the utmost gravity as regards the prognosis.

The intensity or extent of the paraplegia resulting from a wound of the cauda equina is of no prognostic value. A complete paraplegia is not an index of gravity. Motor troubles disappear rapidly. There is often a modification in the excitability of the muscles and in some cases muscular atrophy is characterized by its rapidity and importance. The tendon reflexes disappear in the paralyzed zone and in 15 out of 22 cases the plantar reflex disappeared. Sphincter trouble has been observed in almost every case and is the last to improve.

The cause of death in the fatal cases was meningitis. This complication generally appears from the second to the tenth day. Outside of meningitis, wounds of the cauda equina have a relatively favorable prognosis.

Surgical intervention has for its object the prevention of infection, and for this end it should be instituted as early as possible. It comprises exploration of the wound, removal of bone fragments and foreign bodies, excision of contused tissues, and primary suture. When the dura is intact, it should not be opened, even if there is an intradural blood effusion. Such effusions are often spontaneously resorbed.

W. A. BRENNAN.

**Duroux, E., and Couvreur, E.: Experimental and Clinical End-Results of Nerve Suture** (Résultats éloignés expérimentaux et cliniques des sutures nerveuses). *Rev. de chir., Par.*, 1917, liii, 401.

The animal experiments and clinical results obtained by the authors have shown that the question of the result of nerve suture is still complicated. They think it is now fairly well established that rapid recoveries are quite deceptive. The end-results alone ought to be considered and such results when satisfactory are very slow in making their appearance.

The authors give the clinical history of two cases. In the first the radial nerve was severed by a bullet with consequent complete radial paralysis. The nerve was sutured five months later. It was only at the end of twenty-one months that the patient was considered definitely cured. The fingers could then be placed in complete extension, the thumb had recovered abduction, and the nutrition of the hand and forearm was normal. The distance from the nerve section to the extremity amounted to 620 mm. and it required 630 days to obtain a complete functional result. The penetration of the axones of the central end into the peripheral end progressed therefore at the rate of about 1 mm. a day. The second case was similar, a radial paralysis due to section followed by suture of the nerve. The distance in this case between the nerve section and the extremity amounted to 750 mm. Fifteen months after suture, although functional recovery is observed continuously, it is not yet complete, as abduction of the thumb and extension of the fingers are not yet fully re-established.

In both cases the first six months after suture were occupied by modifications of the trophic disturbances. It is about the seventh month that signs of motor recovery appear.

The authors think that while spontaneous nerve recovery after section is possible, such recovery is always partial. Only a few axones from the central end penetrate the periphery, and incomplete neurotization results.

In estimating the results of nerve suture, the rapid atrophic destruction of muscles and sensory organs following nerve section, especially of the median and ulnar, must be reckoned with, and to this many failures are due. A regenerated peripheric nerve-end has no effect on such atrophied or sclerous tissues. To insure the motor axones of the central end extending exactly into the motor sheath of the peripheric end, and similarly with the sensory

axones, is the ideal toward which the technique should aim. Theoretically, perpendicular suture appears best; but practically, both as regards clinical and experimental results, suture after oblique

parallel section has given the authors the best results.

The authors' experimental and clinical findings are fully illustrated by photographs. W. A. BRENNAN.

## MISCELLANEOUS

### CLINICAL ENTITIES—TUMORS, ULCERS, ABSCESES, ETC.

**Arquellada, A. M.: Congenital Tumors of the Sacrococcygeal Region** (Tumores congenitos de la region sacrococigea). *Pediat. Espan.*, Madrid, 1918, vii, 1.

The author describes two rare congenital tumors of the sacrococcygeal region. The first was in a child three years old, and was of the spina bifida type. At birth there was a swelling the size of an orange in the sacral region which continually increased in size until it attained its present enormous volume. The tumor was depressible in some places and of smooth consistency. It was removed and found to be a mixed tumor of the spina bifida and cystic variety. The child made an uneventful recovery.

The second tumor was of the foetal-remnant type. This was in an infant twenty days old. The labor had been difficult. The tumor was large and had a wide base of implantation in all the sacrococcygeal region. The tumor was sectioned at its base which allowed the posterior face of the sacrum to be seen as far as the vertex of the coccyx. The child recovered. The author discusses the origin and treatment of tumors of this region.

W. A. BRENNAN.

**Jacob, O., and Fauré-Fremiet: Tumors Consecutive to the Injection of Camphorated Oil in Vaseline** (Tumeurs consécutives à l'injection d'huile camphrée préparée avec de l'huile de vaseline). *Rev. de chir.*, Par., 1917, liii, 221.

Vaseline has commonly been employed as a vehicle for certain medicaments such as camphor for subcutaneous or intramuscular injections. This mineral oil is capable of giving rise to tumors in the tissues which present particular characteristics and have a rather serious prognosis. The authors have recently met with 7 such cases, of which they give the clinical histories. They were mostly in soldiers. These cases showed certain common characteristics:

1. The tumors were developed in the regions in which the injections of camphorated oil had been made.

2. They only appeared after a certain time subsequent to the injection, varying from about five months to about two years.

3. The tumors give rise to spontaneous pains with frequent violent sharp attacks of pain. They develop slowly and progressively, spreading from the surface, and infiltrating the deep-lying tissues. They are

hard, resistant, and nodular. They are accompanied by disturbances in the circulation and temperature. They do not show any tendency to ulceration. They do not appear to propagate along the vascular channels. These tumors do not show any spontaneous retrogression; they do not modify the general state; they appear to have a marked tendency to recurrence and give rise to metastases.

Histologically the tumors due to vaseline injections are macrophagic tumors invading the neighboring tissues from the periphery and very probably disseminating their elements into the circulation. They have a sclerous evolution which ends in a partial encysting of injected products and which may bring about necrosis of the tissues undoubtedly due to concomitant vascular sclerosis. The cellular elements are similar to those met with in the case of foreign bodies introduced into the organism. They are comparable to the tumors obtained experimentally by Podwysotszki and Schirokogoroff after injections of very fine silicious powder into the abdominal cavity or into the vascular system.

The authors submit a detailed chemical study of these tumors, which they name vaselinomata. This study includes the total extraction of lipoids; the composition of the neoplastic tissue; the amounts of vaseline oil included in the neoplastic elements.

Etiologically the authors show that while fatty and vegetable oils may become assimilated in the system or removed by leucocytic action, mineral oils are not absorbed; that they may be transported unchanged from place to place; and always act as foreign bodies. The work of several authors on this point is referred to in order to illustrate the mechanical encysting of paraffin or vaseline injected either experimentally or for prosthetic purposes into the system.

All that has been found regarding the origin of the so-called paraffinomata is exactly applicable in the case of vaselinomata. The dissemination of the latter is explainable by the fact that a cell charged with vaseline oil may be carried to a distant point by the blood and become the starting place of a metastasis.

Diagnosis is easy. Knowledge of their possibility and the fact that a primary tumor is developed in the neighborhood of the site of injection draws attention to its nature. Macroscopically such tumors are compact, massive, and nodular, whitish with yellowish adipose spots, which on free section will yield colorless insoluble oil in places. The macroscopic, microscopic, and microchemical characteristics of these fibrolipomatous neoplasms enable



their exact nature to be presumed; but a chemical study to determine their ability to saponify is necessary to verify diagnosis.

In the seven cases reported by the authors, the tumors were removed, but in all cases recurred. The authors think therefore that a wide resection, as in the case of a malignant tumor, is necessary.

W. A. BRENNAN.

**Moreschi, C.: The Pathogenesis of Diabetes Ininsipidus** (Sulla patogenesi del diabete insipido). *Policlin.*, Roma, 1918, xxv, sez. med., 99.

Moreschi studied a case of diabetes insipidus in a girl of nineteen with the history of a traumatism which caused temporary paralysis seven years before. The patient was treated by hypophyseal extracts and the various results obtained are given in a series of tables.

From a study of this case and the literature Moreschi thinks that there are multiple pathogenetic factors involved in the production of diabetes insipidus. Such multiplicity is a direct corollary of Heidenhain's conception that diuresis is the first index of the circulating activity of the kidney. Hence in the presence of a polyuric syndrome it is necessary to take clinical cognizance of all the factors which regulate the renal circulation.

Considering polyuria as intimately associated with direct alterations of the vessels and renal parenchyma, or of the circulation center, and confining the findings to so-called idiopathic polyuria, the etiologic factors involved may be thus summarized:

1. Alterations resulting in hypofunction of the pars intermedia of the hypophysis, i. e., tumors, lesions, chronic inflammations such as tuberculosis.
2. Alterations of the endocrine glands and consecutive functional modifications of the vegetative nervous system (endocrine-sympathetic dystrophia).
3. Alterations in the middle brain especially involving the floor of the third ventricle and hence with great probability the center of origin of the fibers of the vagus and sympathetic.
4. Alterations involving the fibers of the vegetative system in the thoracic tract, i. e., aneurisms of the aorta, tumors of the mediastinum with compression of the vagus and sympathetic, or alterations involving the celiac plexus.

In his clinical study Moreschi reserves his judgment concerning the question of any clinical pathogenetic signs which polyuria may offer which would enable the particular factor or factors to which it was due to be differentiated. Certain cases which he mentions offer the possibility of differentiation, inasmuch as hypophyseal medication caused a reduction of diuresis without any alteration in the urinary concentration, while in the cases of other authors this is raised proportionate to the fall in diuresis.

Moreschi says that the hypophyseal hormone of the posterior lobe is at the present time of great value in the symptomatic treatment of diabetes insipidus.

W. A. BRENNAN

**Taddei, D.: A Simple Method of Hastening Epithelization of Wounds** (Di un mezzo semplice per accelerare la epitelizzazione delle piaghe). *Riforma med.*, Napoli, 1918, xxxiv, 245.

Taddei refers to the fact known to every surgeon that a long time is necessary for epithelization of a wound after the cavity has been filled with granulation tissue and infective processes have been overcome. This is especially so in the severe suppurative wounds of war.

To hasten this process Taddei takes a number of pieces of adhesive plaster which are placed on a cotton pad and soaks the adhesive side with a 10 per cent solution of iodine. The plaster when dry is cut into long narrow strips and disposed along the edges of the granulating wound so as to form a polygonal framework around it. The strips, about 4 or 5 mm. wide, are so arranged that 1 mm. covers the epithelial edge of the wound and the remainder is over the granulating surface. The exposed granulating surface is protected by a thick gauze pad which is fixed at the edges only by narrow strips of adhesive plaster and allows air to reach the wound. This gauze pad absorbs all secretions from the granulating surface and is changed every three or four days.

Taddei has observed epithelization take place under such circumstances in less than half the ordinary time. It is observed that each time the gauze pad is removed epithelization has advanced from 2 to 4 mm. from the adhesive plaster framework edges, the perimeter of which is constantly reduced by freshly applied strips. The new epithelization appears to be stimulated by contact with the iodine surface. This also protects the new epithelium during the change of dressings.

W. A. BRENNAN.

## BLOOD

**Robertson, O. H.: Transfusion with Preserved Red Blood Cells.** *Brit. M. J.*, 1918, i, 691.

At casualty clearing stations during the busy time of an attack, it is obviously impossible to perform transfusions by the usual methods in nearly all the cases in which transfusion is indicated. The difficulty of obtaining sufficient blood under rush conditions, the time consumed in carrying out transfusions, and the need of every available medical officer in the operating theater, all tend to reduce the number of transfusions. The use of preserved human blood cells for transfusion suggested itself to the author as a possible solution of certain of these difficulties.

The experimental work of Rous and Turner is thoroughly reviewed by the author. They found by animal experimentation that it is possible to preserve living red blood cells for four weeks in a solution of dextrose and citrate when kept at ice-box temperature. The author made use of this method of keeping blood for transfusions during a rush period at a casualty clearing station. He gives

in detail the method of the preparation of the preserving solutions. Persons belonging to blood group IV only are used, as this saves the necessity of doing agglutination tests before transfusion, since blood cells of this group are not hæmolyzed or agglutinated by the blood of any individual.

A full description of the apparatus used for procuring the blood, for storing the blood, and for giving the blood is presented in the article. The author's technique of blood transfusion is also given very clearly and in detail.

Twenty-two transfusions of preserved red blood cells were given to twenty individuals, the majority of whom were suffering from severe primary hæmorrhage. A quantity of blood had been stored up beforehand ready for use when needed, and had been kept varying periods of time up to twenty-six days before it was used. Hæmoglobin estimations before and after transfusion were made, and the urine studied for evidence of increased blood destruction.

The results of blood transfusion with preserved red blood cells were found to be quite as striking as those seen after transfusion with blood freshly drawn. There was the same marked improvement, the patients stood operation well, and subsequent progress was quite as good as in those cases transfused by the usual methods. The introduction of kept red blood cells had no apparent harmful effect, as there were no reactions or evidence of increased hæmolysis after transfusion.

The chief advantage of this method over other methods of transfusion in current use is the great convenience of having a large stock of blood on hand for busy times. The transfusions can be given relatively quickly, and the technique, which is simple and easily acquired, can be carried out at the bedside entirely by one medical officer. Experiments in the transportation of preserved blood in an ambulance over rough roads have shown that it can be carried for a considerable distance without injury to the red cells.

E. C. ROOS.

**Bond, C. J.: Further Observations on the Hæmagglutinin Reaction; with Special Reference to the Operation of Blood Transfusion and to Nephritis.** *Brit. M. J.*, 1918, i, 253.

The study by the author of the hæmagglutinin content of the blood serum in a series of 250 patients when tested with his own washed corpuscles and those of sheep has shown that the different human serums vary very much in their hæmagglutinin content when tested with the same standard red cells. Individuals whose serums belong to the same agglutinative group differ in hæmagglutinative capacity, some having a very low and some a high capacity for agglutinating the same washed red cells. This means that the incompatibility of donorship in the operation of transfusion is also of a graded character. Also the agglutinative capacity varies from time to time in the serum of the same patient.

The author also tested the hæmagglutinative capacity of the blood serum in 50 cases of nephritis. Of these a second examination has been made after an interval in 25 cases and a change in the hæmagglutinative capacity was observed in 15. In 7 cases a negative was converted into a positive reaction, and in 8 from a lower to a higher hæmagglutinin content.

The two blood examinations were made in nearly all cases at about a month's interval, and most of the patients were improving generally, with a diminution in the amount of albumin in the urine.

Patients suffering from albuminuria consequent on nephritis show on the whole a lower hæmagglutinin content of blood serum than is found in a corresponding group of partly healthy persons. If this reduced hæmagglutinin content in nephritis cases is considered in conjunction with the rise in the hæmagglutinin content which takes place as the albuminuria diminishes and the patients recover, it may be concluded that a leakage not only of serum albumin and globulin but also of hæmagglutinin does take place from the kidneys in nephritis.

If the blood serum of a recipient may be at one time compatible with the red cells of a given donor, and at another time may agglutinate those cells, the donor's serum may also, as the result of recovery from infection or other illness, change in the same way.

V. C. HUNT.

## BLOOD AND LYMPH VESSELS

**Marquis: The Danger of Early Operation in Jugulocarotid Aneurisms** (Des dangers de l'intervention précoce dans les anévrismes jugulocarotidiennes). *Bull. et mém. Soc. de chir. de Par.*, 1918, xlv, 458.

Marquis recently operated upon 2 cases of jugulocarotid aneurisms in which threatening severe hæmorrhage demanded immediate intervention. Ligature was done, but within a few days death occurred in both cases from cerebral complications.

Marquis therefore questions whether ligature of the primary carotid should not be replaced by a conservative operation. Reviewing the literature he finds 39 cases of such aneurisms, of which 36 have been operated upon and 3 recovered without operation.

The majority of jugulocarotid aneurisms furnish one of the two operative indications formulated by Baudet: increase of volume, and production of serious functional disturbances. But the surgeon may find himself impelled to operate at an inopportune time by threatening hæmorrhage. Most surgeons fear ligation of the primary or internal carotid and only a few have been able to accomplish it.

Conservative operations carried out at present are of two kinds: arteriorrhaphy and endo-aneurismorrhaphy. Of arteriorrhaphy there are only 4 clear examples in the war literature. In only 1 of these cases was the arterial breach sutured after



freshening the edges of the hole. This was done forty-two days after injury. Only 3 cases of endo-aneurismorrhaphy have been reported; 2 of these recovered. The operation apparently does not offer great difficulties.

Both arteriorrhaphy and endo-aneurismorrhaphy call for minute dissection of the aneurism. But there are times and circumstances in which dissection can only be above and below the aneurism and the sac cannot be isolated. The time is within three weeks after the accident. The circumstances are adhesions due to infection of the peri-aneurismal tissues.

Apart from the two excellent conservative operations referred to, there is Tuffier's arterial intubation. In those cases, especially where dissection of the aneurismal sac is impossible, this method can be tried.

Of the 36 operated cases in literature, 28 were treated by ligation. The most important factor here is the age of the aneurism, for the effect of time is to favor collateral circulation. Operators, however, generally do not appear to have been struck by the importance of this factor and in only 15 cases has the precise time of intervention been stated. These 15 cases are divided into: (1) those operated upon after more than twenty days; (2) those operated upon less than twenty days after injury. Of the first type there are 10 cases, all of which recovered without any paralytic complications. There are 5 cases of the second type, followed by paralysis or death.

The study of these 15 cases leads Marquis to conclude:

1. Ligation of the primary or internal carotid for jugulocarotid aneurism does not usually give rise to cerebral complications if it is done more than twenty days after the injury.

2. This ligation done within the first twenty days following injury causes cerebral complications which may be grave or fatal.

3. Unfortunately the treatment on which these conclusions are based is not always realizable. A threatening hæmorrhage may force an early operation. A conservative operation will not benefit on account of the dense adhesions at such a period; and ligation cannot be done on account of its dangers.

W. A. BRENNAN.

**Bastianelli, P.: Femoral Arteriovenous Aneurism in Scarpa's Triangle; Lateral Suture of Artery and Vein; Recovery** (Aneurisma artero-venoso della femorale di nel triangolo di Scarpa; sutura laterale dell'arteria in 2 tratti; sutura laterale della vena; guarigione). *Clin. chir.*, Milano, 1917, xxv, 110.

This case of arteriovenous aneurism of the right femoral in Scarpa's triangle, four fingers below Poupart's ligament, was treated by lateral suture of the artery and vein because the condition of the walls permitted it. The man made a complete recovery in eighteen days.

In Soubottitch's statistics of the Balkan and present wars, 10 out of a total of 21 arteriovenous lesions of the femoral were treated by lateral suture of the artery and ligature of the vein. None of the literature available to the author shows an aneurism of this type treated by simultaneous suture of the artery and vein. In this case not only was lateral suture of the artery and vein done in the communicating orifices caused by the projectile, but also the small exit orifice in the posterior circumference of the artery was sutured. The special needles called for by the Carrel technique were not used, neither were the delicate Carrel hæmostatic forceps. The author thinks it worth recording that the operation can be successfully done without either. Common intestine silk suture needles were used, both vessels having two rows of sutures. Circulation was perfectly restored permanently. W. A. BRENNAN.

**Woolley, P. G.: Three Cases of Parietal Aortic Thrombosis.** *J. Lab. & Clin. Med.*, 1918, iii, 539.

In this report of three cases of aortic thrombosis the occurrence was at the site of luetic lesions in the aorta from which emboli were carried to various parts of the body. Two of the patients presented neurologic symptoms with mental changes, while the other was in a stuporous state when admitted. Although it could not be demonstrated, it was the author's opinion that the marked mental changes which were present in the first case were due to multiple small infarcts into the cerebral cortex. Sections of the cerebrum showed perivascular infiltrations, œdema, and round-cell infiltrations of the pia, all of which are evidences of paresis. Definite infarcts were in the kidneys, lungs, and spleen.

The second case was one of paralysis with a clinical diagnosis of cerebral hæmorrhage and lues. The necropsy findings revealed a large cerebral embolism, thrombosis of the left carotid and aorta with an aneurism of the aortic arch and innominate artery, and a luetic mesaortitis.

In the third case a clinical diagnosis of uræmia seemed probable, but the presence of blood in the spinal fluid and moderate elevation of blood-pressure suggested a possible pachymeningitis hæmorrhagica interna. The necropsy findings showed a distinct syphilitic aortitis with mural vegetations at the origins of the great vessels, with large emboli in the cerebral cortex. P. W. SWEET.

## POISONS

**Sacquépée, E.: Researches on Gaseous Gangrene of War Wounds** (Recherches sur la gangrène gazeuse des plaies de guerre). *Presse méd.*, Par., 1918, xxvi, 197.

In a previous article Sacquépée studied the œdematous forms of gas gangrene. He now takes up the study of the gaseous forms. Clinically this type is most commonly observed as a toxic gaseous tumor around the wound. The existence of infiltration in the skin is easily perceived. The local in-

toxication is accompanied by a general intoxication. The gangrene becomes diffuse and leads to gaseous septicæmia. Anatomically the lesions of true gangrene are muscular.

Bacteriologic findings based on 121 analyses are as follows: bacillus perfringens, 82 cases; typical septic vibron, 28 cases; atypical septic vibron, 11; bacillus sporogenes, 21 cases; bacillus bellonensis, 35 cases; bacillus putrificus, 11 cases; staphylococcus, 65 cases; streptococcus, 27 cases; enterococcus, 17 cases; proteus vulgaris, 28 cases.

While the figures show that several species of germs are often found associated, Sacquépée remarks that there is almost no case of primary gaseous gangrene in which the presence of either the septic vibron (typical or atypical) or the bacillus bellonensis cannot be demonstrated.

Experimentally the septic vibron and the bacillus bellonensis give *in vitro* a very active toxin which at once sets up local œdema and necrosis, as well as general phenomena which cause death. But it has not yet been shown that the bacillus perfringens possesses these qualities.

Many authors have attributed a pathogenic rôle to a number of organisms met with in gaseous gangrene. Sacquépée does not agree with them, because: (1) it presumes that a variety of organisms could produce the same disease, which is always identical; and (2) because it would not permit specific medication. Now the facts show without doubt that the septic vibron and the bacillus bellonensis play a specific pathogenic rôle in gaseous gangrene; that they have the toxic properties and experimentally reproduce the lesions. Therefore it is impossible not to consider them as the specific agents of the disease. The exact part played by the bacillus perfringens is not clearly established.

W. A. BRENNAN.

**Peyret and Fournier: The Ilbarritz Hospital for Surgical Tuberculosis Cases** (Un centre de tuberculoses externes; l'hôpital d'Ilbarritz). *J. de méd. de Bordeaux*, 1918, lxxix, 89.

The hospital at Ilbarritz is one of the many provided since the beginning of the war for the treatment of bone and joint tuberculosis in soldiers by rest and heliotherapy associated with orthopedic treatment. The building is situated near Biarritz on a high hill overlooking the sea. The first story with its dressing rooms, etc., is reserved for patients with large suppurating lesions; the upper stories are used for the less severe, non-suppurating cases. All stories are well supplied with outside galleries where the patient can be exposed to the sea air and sunlight. The first essential in treatment is rest. This is rigorous for spine and hip disease, but is modified for other patients according to the degree and location of their lesions. All bone and joint cases have a plaster apparatus in which windows are cut which expose the diseased area to the sun's rays. Punctures, injections, and orthopedic appliances are used as indicated.

Since its establishment six months ago 182 patients have been received; 71 of these were cases of Pott's abscess; 18 were coxalgia; 49 were arthritis; 26 were osteitis. As regards age, 88 of the patients were under and 94 were over twenty-five years; 17 were above forty. It is therefore not quite correct to say that only the young are subject to surgical tuberculosis. In 104 cases there was some personal or family history of tuberculosis. War service appears to have a marked effect on the outbreak of osseous tuberculosis, as only 45 of the patients have not been at the front; 91 have been there for more than a year.

Of the 180 cases received, 27 showed double or multiple localization and 105 had fistulæ on arrival. About half of the cases of fistulæ appeared to have had their origin in late operations, a simple incision for the most part; 66 fistulæ appeared to be of operative origin.

Although only six months have passed since the opening of the hospital, there have been 24 patients already evacuated completely cured; and 34 others are on the way to good recovery. The latter include 13 cases of Pott's abscess, some fistulous which have generally been treated by immobilization and heliotherapy alone. There have been 7 deaths, 6 due to cachexia. The authors think that the results will be better when they are able to receive cases earlier, before they become fistulous.

This hospital for tuberculous soldiers is partly supported by American generosity.

W. A. BRENNAN.

## ROENTGENOLOGY

**Hernaman-Johnson, F.: The Value of X-Rays in the Diagnosis of Abdominal Disease.** *Med. Press.*, 1918, cv, 409.

The author states that the radiologist should not be judged by the number and beauty of his photographs, nor by his electrical equipment, but by his success in unraveling the diagnostic puzzles sent to him for solution. He gives several helpful suggestions in diagnostic procedures, such as the localization of a renal stone by the method used in determining the vertical depth of bullets.

In the opaque meal and enema he suggests that the patient be examined while leading his every-day life and eating his ordinary food, as pathological conditions can sometimes be noted. Previous to the barium meal it is well for the patient to live on finely divided food for a day or two to avoid undigested lumps.

He sums up the usefulness of the X-ray along the following lines:

1. Urinary system. Calculus in the kidney, bladder and ureter. Enlargements, malformations, alterations in the position of the kidney.

2. Alimentary tract. Disorders of function, ulcers of the stomach and duodenum; by inference in early stages, by direct demonstration in the later. New-growths which alter the form of the gastric or



intestinal shadow. Correlation of tender spots with particular parts of the tract, e.g., the appendix.

3. Liver and gall-bladder. Alteration of the liver outline (with or without inflation of the colon). Demonstration of an enlarged gall-bladder. Demonstration of gall-stones in 10 per cent of cases.

4. Genital organs in the female. Malformations in the uterus have been shown by the injection of collargol, but the scope for this is limited. By the demonstration of the cæcum and appendix indirect information is, however, often obtained. In certain cases of doubtful pregnancy assistance may be obtained, but only at a somewhat late period. Calcification of myomata may be detected.

5. Spleen. This organ is somewhat neglected by modern radiologists, though it is mentioned in the textbooks of fifteen years ago. The normal spleen is visible in children, and in very thin adults. Enlargements can often be demonstrated. The existence of this viscus should not be forgotten when interpreting radiographic appearances in the left abdomen.

C. B. HOLLINGS.

**MacKenzie, W. R.: Remarks on Roentgenographic Pelvimetry.** *Brit. M. J.*, 1918, i, 612.

The author refers to the usual methods of pelvimetry, drawing the conclusions that the external method is unreliable, and that the objection to the internal pelvimetry is the necessity of an anæsthetic for accurate diagnosis. The objections to the ordinary roentgen plates for the determination of the exact size of the pelvis were based on the deformity resulting from a distortion due to the varying levels of the pelvic landmarks. By the author's method, this is overcome.

To quote the author: "In a normal pelvic bone, which is designated the standard pelvis, the various diameters, both external and internal, are accurately measured. When this bone is radiographed, definite points can be marked on the plate; the distance between these points will bear a definite ratio to that between the corresponding points measured on the pelvis. This radiograph is taken as the standard plate. By radiographing the patient in the same position as the standard pelvis, having the points of focus the same, the X-ray tube at the same angle and the same distance from the sensitive plate, an accurate comparison of the patient's plate with the standard plate will be obtained, and therefore of the patient's pelvis and the standard or normal pelvis. From it, the internal measurements can be mathematically worked out."

The author's conclusions follow:

1. A standard plate for pelvic measurements is necessary.

2. The patient must be radiographed in the same position as the standard pelvis, having the same point of focus, the X-ray tube at the same angle, and at the same distance from the sensitive plate.

3. It shows to advantage the variety of pelvic contraction, and the various pelvic diameters can be worked out easily.

4. There is a minimum amount of discomfort to the patient compared to other methods of pelvimetry.

5. There are no ill effects to the fœtus.

W. A. EVANS.

**Pfahler, G. E.: Adjuncts to Roentgenotherapy in the Treatment of Malignant Disease.** *Am. J. Roentgenol.*, 1918, v, 249.

The author has found that some cases of malignant disease in which the lesion does not disappear completely or permanently by roentgenotherapy alone are made well by the use of certain adjuncts. First among these aids he places electrocoagulation. He uses it in nearly all instances to destroy superficial malignant disease before applying the roentgen rays. As a second adjunct he mentions surgery. In dealing with the great bulk of deep-seated tumors, surgery should receive first consideration, but in every case of malignant disease such surgical intervention should be followed by roentgen ray treatment. Metastatic glands should always be resected surgically, when possible, instead of depending on the X-ray to control their growth. A third adjunct is radium. This should never be applied through the same skin or mucous membrane area as the roentgen ray. It can be utilized to great advantage in the treatment of all malignant disease involving cavities. By being introduced within the cavity it offers another source of cross-firing and often at much closer range than the roentgen ray.

The author gives detailed histories of a number of cases in which two or more of the methods mentioned were used and the results obtained. He reaches the following conclusions:

1. The above cases have been selected with the idea of illustrating the type of case that will not respond to roentgen ray treatment alone, but which can be made well if the roentgen ray treatment is combined with one or more well-recognized methods of treatment of malignant disease, which, for convenience, are called adjuncts.

2. In many of these cases the author believes that nothing short of the combinations used would have cured the patient.

3. The author makes a plea for an early survey of the whole case and a careful choice of treatment, for this will save much suffering, much time, and much waste of energy.

ADOLPH HARTUNG.

**Salmond, R. W. A.: A Technique for the Lateral View of the Upper End of the Femur.** *Arch. Radiol. & Electrotherap.*, 1918, xxii, 297.

The author describes a method of obtaining a lateral view of the upper end of the femur which he considers an improvement over the Hickey method of obtaining the same view. He points out that the chief value is in demonstrating the relative position of the bony landmarks of the upper end of the femur and foreign bodies. The directions for obtaining the plates are as follows:

"The patient lies on the couch in the lateral position, with the hip to be examined against the table. The plate is placed in position below the patient and flat on the table.

"The lower limb, resting on the table in the lateral position, is now securely immobilized by sand bags above and below the knee and across the foot. The patient is next asked to let his body and the lower limb which is free swing gently backward, and in doing so it will be found that the femur of the immobilized limb does not take part in the movement. What happens is that the pelvis rotates around the head of the fixed femur and the opposite limb is thus got out of the way. Sand bags or pillows are now placed under the patient's chest and back and around the free limb to make him comfortable and to keep his whole body at rest. The tube, overhead

and parallel to the plate and table, is then centered over the head of the femur and the exposure made. The extension tube can be brought down to the surface of the skin without interference with the opposite thigh or side of the pelvis. Stereoscopic views can also be taken in this position.

"The result is a true lateral view of the outline of the head, neck and trochanters of the femur, though not, of course, of the pelvis, as it has rotated. Because of this, the view cannot be properly described as a lateral one of the hip-joint. As a test that a true lateral view has been obtained, the posterior dense margin of the femoral shaft should be seen running up to and becoming continuous with the outline of the lesser trochanter, and should not be seen running across its base independently."

W. A. EVANS.

## MILITARY SURGERY

NOTE.—Readers are referred to the Table of Contents for other articles dealing with military surgery which appear under the various headings according to our anatomical arrangement.

**Piqué, R.: Advanced Surgical Posts** (Postes chirurgicaux avancées). *Bull. et mém. Soc. de chir. de Par.*, 1918, xlv, 613.

After another year of war experience Piqué reports on the functioning of advanced surgical posts. The creation of these posts, due to the newer ideas of the value of immediate radical surgical treatment of important war wounds, was opposed to the older idea of evacuation of the wounded from the front rapidly. Even with the best automobile transportation, too many of the wounded reached the surgeon in front formations in a condition which rendered attempts at surgical treatment useless.

In the advanced posts the wounded are received in good operative condition within two hours of injury. The principle of the post is that it is an anti-shock station which is organized and equipped for complete major surgery and hospitalization; and it receives only those wounded who are untransportable.

A model subterranean advanced post is described in detail with plans. It is about 200 feet long and 60 feet wide, being from 15 to 30 feet below the surface and fully protected. It contains an operating center, hospital, and quarters for the staff. The operating service provides all necessary accessories, dressing rooms, a radiologic department, sterilization chamber, etc. The hospital contains heating chambers and beds for the patients whence they can be evacuated to more remote surgical units, usually within eight days. The post has a capacity for about 50 inmates, including the staff.

The functioning of such a post showed that among the seriously wounded received, there were nearly 72 per cent of recoveries. Two-thirds of the wounds were primarily sutured successfully. A very small proportion of streptococcus infection was observed.

The advanced surgical post is the bond between

the advanced surgical automobile ambulance and the surgical center. In a period of calm it directly receives and operates upon the severely untransportable wounded from the ambulance with which it is in communication by telephone. In active fighting if an attack is made by the enemy, timely preparations are made for the evacuation of the advanced post. If the attack is made from its own side the advanced post is so constructed that it either becomes the nucleus of a fixed surgical unit or is dismantled and moves forward with the advancing line to a site selected for a new advanced surgical post. It is a striking example of the adaptation of surgery to the conditions of stationary warfare. W. A. BRENNAN.

**Dunham, E. K., and Others: Empyema in Base Hospitals.** *Rev. War Surg. & Med.*, 1918, 1, No. 6.

The early recognition of the streptococcus epidemic that invaded the camps in January and February of the present year led to the immediate adoption by the professional divisions of various measures aimed at investigation and alleviation. With the supervision of the Surgical Division, under Col. W. H. Moncrief, and with the active co-operation of the Laboratory Division, under Col. F. F. Russell, and the Medical Division, under Col. W. T. Longcope, the authors were charged with the study of this question in its various phases.

The paper which furnishes the basis of this abstract is the preliminary report of the Empyema Commission located at Camp Lee. The members of the Commission include the chairman, E. K. Dunham, E. A. Graham, J. F. Mitchell, A. V. Moschowitz, R. D. Bell, R. A. Kinsella, F. A. Stevens, C. C. Hartman, W. L. Tower, T. M. Rivers, F. D. Zeman, and M. B. Cohen.

Among the complications that increased the gravity of the infections none were more serious than



the empyemas. An outline of investigation was formulated and its prosecution developed along two lines. First, a special group consisting of surgeons, internists and laboratory workers were located at Camp Lee where a large group of patients were available for study. Second, a so-called empyema team, consisting of an internist, a surgeon, and a laboratory worker, was appointed by the commanding officer from the personnel of each base hospital. A preliminary report of progress has just been made by the Empyema Commission and by the empyema teams located at Fort Sill and Fort Riley. A preliminary report on the treatment of empyema by the Carrel-Dakin method at the War Demonstration Hospital of the Rockefeller Institute is included. A combined summary of these reports follows:

*Definition.* According to the Rockefeller Institute workers, a case is one of empyema if on thoracic puncture macroscopic pus is found, or if pus cells and organisms are demonstrated by the microscope. The Empyema Commission does not define its use of the term, but the inference is that they consider any case of respiratory tract infection having a pleural exudate as empyema. "A massive pleural exudate is frequently present very early, accumulating within a few hours and often is the first sign of respiratory tract infection. This exudate, moreover, at first is not purulent but serofibrinous. Our observations show that usually a period of from two to three weeks must elapse before the exudate becomes frankly purulent." The distinction between a serofibrinous and a purulent exudate seems of importance in its bearing on the discussion of early or late operation. In civil practice probably most surgeons simply aspirate in pleurisy with effusion, as long as the exudate is not frankly purulent, even if turbid and containing microscopic pus.

At Fort Riley the epidemic began last autumn. In the period from October 20 to January 29 there were 97 cases, most of them occurring in November and December. From January 29 to April 30 there were 140. A survey completed April 1 showed 970 draining empyemas at that time in the base hospitals of the cantonments. In April 315 new cases of empyema were reported; in May, 217, and in June, 62.

*Bacteriology.* Laboratory studies undertaken at Fort Sill, Oklahoma, consisted of cultures from nose, throat, blood and pleural exudates and leucocyte and differential blood counts and agglutinin studies. Cultures from the tonsils and nasopharynx taken during January and February showed the presence of a hæmolytic streptococcus in 20 per cent of apparently normal individuals. Cultures from the nasopharynx and tonsils in 38 empyema cases showed 57.9 per cent of hæmolytic streptococcus in the tonsils. Blood culture from 37 cases of empyema showed hæmolytic streptococcus in one case seventy-two hours before death. Of specimens of sputum from 18 patients who later developed empyema, 61.1 per cent contained hæmolytic streptococcus. One hundred and forty-eight specimens of pleural exudate were serous in 15.5 per cent; seropurulent in

56.1 per cent, and purulent in 28.4 per cent. Hæmolytic streptococcus was isolated in 92.5 per cent of these specimens. At Fort Lee the organism was found in all cases with pleural exudate. Attempts to determine the presence or absence of specific agglutinins and to ascertain by means of agglutination reactions whether the type coccus was the same in all cases failed because of the irregularities of the serologic reactions of the coccus. In the pleural exudates, of 72 patients who died, hæmolytic streptococcus was found in 94.4 per cent.

*Postmortem findings.* In 50 postmortem examinations the pleural exudate was serous in 6 per cent; seropurulent in 78 per cent, and purulent in 16. The pericardial fluid in 27 cases of pericarditis was serous in 40.7 per cent; seropurulent in 51.5 per cent, and purulent in 7.8 per cent. The fluid in 12 cases of peritonitis was seropurulent in 75 per cent, and purulent in 25 per cent.

*Lungs.* An extensive bronchopneumonia was present in 70 per cent. In 30 per cent the process was that of an interstitial pneumonia. Two cases were typical of lobar pneumonia. Peribronchial adenitis was present in 60 per cent. Multiple abscess of the spleen was noted in 3 cases. Marked hæmolytic jaundice was present in 3 instances. One post-mortem reported by the Empyema Commission showed multiple small lung abscesses and a suppurative pericarditis.

*Symptoms and signs.* The clinical picture presented by infections of the lungs and pleura due to hæmolytic streptococcus varies. Notably in the early months of the epidemics the onset in a large portion of cases followed measles. Later many have been primary in the sense that they did not follow any of the acute infectious diseases. In some the lungs, in others the pleura, are predominantly involved. In other instances there is extensive infection of both lungs and pleura.

The initial symptoms resemble those of other acute infections. There is a history of sore throat, coryza, cough with mucopurulent sputum, headache, malaise, and fever, often of several days' to a week's duration. A chill and sharp pain in one side of the chest, whether primary or following the above mentioned symptoms, brings the patient to the hospital.

In a severe hæmolytic streptococcus bronchopneumonia the picture is predominantly that of acute air hunger. The breathing is rapid and labored, made worse by restlessness and an exhausting cough. The face is flushed and anxious, lips and mucous membranes dry, ears and extremities cold. The pulse is rapid, temperature irregular, and associated with drenching sweats. A patient with a large effusion but with little lung involvement, on the other hand, does not show the symptoms of acute air hunger, and if not delirious is quiet and often drowsy.

The physical signs are those of bronchopneumonia and of pleural exudate, varying more or less according to which predominates. Patients with broncho-



pneumonia usually recover by lysis. There may be an afternoon temperature up to 100 degrees for weeks. The physical signs disappear very slowly. Râles, dullness and altered breath sounds may persist for more than a month.

Differential diagnosis between a massive exudate and a pleural effusion may be difficult. Percussion and palpation, while the most reliable physical signs, may fail. The blood shows a marked polymorpholeucocytosis in the majority of cases. X-ray and the aspirating needle are the surest means of an accurate diagnosis.

*Treatment.* During the first months of the epidemic a primary drainage operation was performed, as a rule, as soon as the diagnosis was established. The mortality at this period was very high. At Fort Riley, Kansas, there occurred in the period from October 20 to January 29, 97 completed cases. Of these, 82 were operated upon, with 52 deaths or a mortality of 63.4 per cent. Fifteen died without operation. Seven of these were undiagnosed until autopsy. The average death rate based on replies to a questionnaire, under date of February 21, 1918, was 30.2 per cent. The highest was 84 per cent in 85 cases.

From January 29 to April 30, 1918, there were at Fort Riley 137 cases. Of these, 34 received no treatment. Eleven of this number were undiagnosed until autopsy. Of the remaining 103, 13 were treated by repeated aspiration only. Seven of these died; the other 6 recovered without operation. Of 66 operated cases, 43 were done within a month of the date of the report, and all were still in the hospital at that time. Of the 25 operated upon during February and March, 5 died. Of the total of 137 cases, 47 died, a mortality of 34 per cent.

The Empyema Commission, using the same principle of repeated aspiration and using intrapleural antiseptics following the drainage operation, on June 28 were able to report 23 consecutive cases with one death. Commenting on these figures they state: "Our very low mortality in comparison with the much higher mortality which has existed in other camps, as well as in this camp, previous to the Commission's control of the cases, may have been due somewhat to a change of virulence of the organism and to correspondingly less marked manifestations of its invasion of the body. We feel, however, that the chief factor in reducing the mortality has been the method of treatment, for there can be practically no doubt that our cases have been of the same general type as those which have occurred elsewhere." Then treatment has been "late operation and careful painstaking attention to the postoperative care of the patients, including maintenance of nutrition, as far as possible. We feel that the care given to keeping up the nutrition of our patients both before and after operation has been one of the most important factors of all." The further postoperative care, besides keeping up a large fluid intake, has consisted in the use of intrapleural antiseptics.

That the Empyema Commission makes too little allowance for marked variation in the virulence of the hæmolytic streptococcus seems evident from the fact that at Fort Riley during the same period, practicing primary aspiration and secondary operation, there was a 34 per cent mortality in 137 cases, among which 11 died before a diagnosis of empyema could be established, 23 died before aspiration could be performed, and 7 of the 13 cases aspirated but not operated upon died. That massive exudate may occur in twenty-four hours, the Empyema Commission experienced. The rapid course in some instances is evidenced by the statement of the Fort Riley surgeons. "Most of the completed cases were of such fulminating character that they died either before any treatment of the empyema condition or after one or two aspirations." It seems obvious that neither pre- nor postoperative treatment would be of much avail in these cases.

The Empyema Commission points out that the exudate in streptococcus pleuritis is at first serofibrinous, remaining so often for several weeks before becoming frankly purulent, and that during this stage the lung remains free and collapsible. Operation performed during this stage when there is already marked dyspnoea and cyanosis, by producing more or less pneumothorax and so less available breathing surface, further increases the asphyxia. During this stage of severe toxæmia, moreover, the organism has urgent need of oxygen in combatting the infection. They have found suction drainage apparatus during this stage cumbersome and unsatisfactory. There is danger also of blood-stream infection from absorption of streptococci from the fresh wound as shown by positive blood culture in one case that before operation was sterile. The advantages that would accrue from draining away toxins and living organisms is more than offset by these complications.

Relief of mechanical embarrassment due to accumulated exudate can be secured by repeated aspiration. The Commission as a rule aspirated at intervals of from two to six days. On an average four aspirations were performed on each patient. Occasionally a patient had to be aspirated every twenty-four hours. Usually by the time of the fourth aspiration two or three weeks had elapsed, the fluid had changed to pus, and the patient's condition very materially improved. Late operation, they found, also seems to be followed by less troublesome convalescence. Just how a late operation after "limiting adhesions have formed preventing further collapse of the lung" also predisposes against a chronic empyema cavity is not clear. Adhesions limiting the collapse of the lung one would expect also to limit its further expansion.

Drainage operation the Commission performed under 0.5 to 2 per cent cocaine anaesthesia. Infiltration was made in the proposed line of incision and also of the appropriate intercostal nerves close to the spine. Incision was made usually in the eighth interspace in the posterior axillary line,



followed as a rule by rib resection. The importance of good and continuous drainage is emphasized. An arrangement of tubing and bottles designed to drain and irrigate the cavity is described and figured. The apparatus consists of a water bottle, gravity suction arrangement to evacuate the pus, with a T tube inserted between the patient and the first bottle for connection with a Dakin solution reservoir. All the cases treated under the care of the Commission received treatment with either Dakin's solution, dichloramine-T, 5 per cent in chlorocane, or chloramine-T in 0.5 per cent to 1 per cent aqueous solution. Of these Dakin's solution gave the best results. The technique employed was essentially that outlined by the Rockefeller Institute workers and is summarized below.

The Commission also made a study of the nitrogen output of patients in the early stages of empyema associated with hæmolytic streptococcus. Determinations of nitrogen in urine and exudate were made in 3 representative cases. The daily excretion of nitrogen into the pleural cavity was obtained by measuring and analyzing the exudate every time the patient was aspirated. After operation the exudate could not be collected and the daily pleural nitrogen excretion was assumed to be the same as just before operation, not over two and one-half grams per day. The patients had been kept on a soft diet containing 1,100 to 1,700 calories and were losing from twelve to twenty grams of nitrogen per day. They were placed on the regular hospital diet, supplemented by extra feedings of eggs and milk. It was found that in the acute stage of the disease 3,000 to 3,300 calories are needed to maintain equilibrium. Practically the same amount is needed to maintain body weight and it is recommended that patients be placed on a standardized diet of this caloric value as early as possible and kept on it until they have reached their normal weight.

Regarding the use of antistreptococcus serum in pneumonia and empyema, the Fort Riley report reads as follows: "When administered in empyema cases either intrapleurally at the time of aspiration or intravenously on the day following aspiration, I have noted no change which could not be ascribed to the evacuation of the pus. The serum used has been the commercial polyvalent product, Mulford's and Lederle's." The Empyema Commission writes: "At present there is little evidence that available sera are useful."

The treatment of empyema by the Carrel-Dakin method at the War Demonstration Hospital, the Rockefeller Institute for Medical Research, was as follows: Most of these cases were postpneumonic. Some were operated upon as early as the third day following the onset of pneumonia. The longest period which elapsed before operation was 120 days. Operation was performed under 1 to 400 novocaine. Incision was usually made over the eighth or ninth rib, followed by rib resection. Negative pressure by means of suction apparatus was tried but discarded as unsatisfactory.

In the early cases the pleural cavity was not flushed out at operation. Three to five Carrel perforated tubes were placed in the cavity extending to all points and two large short tubes were inserted in order to have a free outflow of secretions and chlorinated material. In the later cases the pleural cavity was flushed out with Dakin's solution at the time of operation, the large tubes omitted, and the Carrel tubes were stiffened by silver wire. Compresses wet with Dakin solution were placed in the external wound instead of the large tubes originally used.

As no untoward effect was noted following the use of 0.2 per cent solution in the early cases, the strength was increased to 0.5 per cent. In late cases this has been used every hour during the day and every two hours at night, and the amount increased to 80 or 100 ccm. of Dakin's solution.

Dressings are made daily. A smear from the inside of the pleural cavity is taken for microscopic examination, the cavity is flushed out, the individual tubes tested, and fresh tubes inserted when necessary. Compresses wet with Dakin's solution are then placed in the external wound as at operation, the skin protected with vaseline compresses or zinc oxide ointment and a cotton pad and chest binder applied. The external dressings are changed by the nurse as necessary.

In the early cases closure took place spontaneously in from three to seven weeks. In the later cases secondary closure with suture has been made when sterilization was obtained as shown by bacteriologic curve and in some cases by culture as well. Cultures taken at the time of dressings have been found sterile in from six to nine days. Secondary closure was effected with silkworm through anesthetized skin and fascia. The skin edges were freshened but granulations not disturbed. Primary union was obtained in about 70 per cent of the cases. When secondary sterilization was necessary, this was readily obtained in all cases in a week or less, and complete closure was the final result.

After operation the patients were comfortable and in general free from toxic symptoms. All patients were put on a full diet and given lung exercise as soon as possible after operation.

Forty-five treated cases are reported; 32 were cases of streptococcus, 9 of pneumococcus infection, and in 4 it was impossible to isolate any one type of organism.

At operation the fluid was perfectly free in the pleural cavity in the majority of cases. The fluid was usually thin and watery and of a greenish, yellowish, or brownish color. In some a large amount of fibrin was present. There were 12 deaths, a mortality of 25.6 per cent, 9 of which were of the streptococcus group. At autopsy pericarditis was found in 5 cases together with one or more of the following lesions: cervical adenitis, mediastinitis, miliary tuberculosis, intestinal ulceration, peritonitis, numerous small lung abscesses and small kidney abscesses; one case of general tuberculosis, 3 cases

with pneumonia involving the other lung and a beginning fibrinous pleurisy. The ultimate results in the 45 cases are summarized as 12 deaths, 11 still in the hospital under treatment, and 22 cases discharged with wounds healed clean and solid, and the lung, as judged by physical examination and X-ray, normal.

In a preface to the above mentioned reports Lieut. Colonel Allen B. Kanavel writes: "Studies have progressed far enough for us to emphasize the following points:

"If treated promptly and efficiently, the wounds may close in less than a month.

"The proportion of patients being returned to duty status is constantly increasing.

"Proper and persistent treatment of these patients will apparently reduce the final number of extensive operative procedures to a minimum.

"No extensive plastic operations to close cavities should be undertaken until at least six months have elapsed.

"If the discharge persists for longer than two months, special study should be made as to the presence of poorly drained cavities or other local vicious conditions.

"Persistent and proper care will almost always produce a spontaneous recovery." C. A. HEDBLÖM.

**Gray, H. M. W.: The Treatment of Gunshot Injuries of the Spinal Cord at Casualty Clearing Stations.** *N. Y. M. J.*, 1918, cvii, 937.

Operation in all but hopeless cases will, although attended by many failures, give quicker improvement and more complete recovery than a less active line of treatment in which abnormalities surrounding or actually in the spinal cord are not removed. Recovery of function is obtained in such a small percentage of cases however that during a "push" only very selected cases should be operated upon in a casualty clearing station. In late cases the patients are usually in poor condition, suffering from pulmonary or urinary complications, and the parts are obscured by masses of fibrous tissue. In early cases operation is much simpler. The author emphasizes the importance of catheterizing all cases suffering from retention before sending off such cases on the ambulance train.

There are three types of cases which arrive at the casualty clearing station showing paraplegia:

(1) in which the symptoms are due to local concussion; (2) in which the cord is organically severed; and (3) in which paraplegia has developed sometime after the injury. The paralyzing effects of local concussion are often very marked. This may be caused by the passage of a missile close to but outside the spinal canal. In such cases paralysis begins to clear up within a few days. If no sign of return of function appears after nine or ten days, the question of operation for removal of possible blood-clot or depressed bone arises, but this must be decided at the base. It is obvious that men with a complete sudden paraplegia should not be kept in the casualty clearing station if otherwise fit to travel.

Roughly speaking, indications for operations in casualty clearing stations are: in the presence of incomplete paralysis of motion or sensation below the lesion especially; if X-rays show displaced fragments of bone or the presence of a piece of metal on or near the cord; when the symptoms of paralysis have developed some time after the infliction of the injury, unless due to inflammation in cases which have been lying out, when operation is practically hopeless, because in this class of cases the slow onset of paralysis may be due to some depressed fragments after motion or to a blood-clot formation; when pain due to pressure on nerve-roots is excessive and uncontrollable. In all other cases it is better when feasible to evacuate the patient without delay.

Certain operative details mentioned by the author are the following: Local anesthesia is effective and easily carried out. The use of adrenalin renders the field practically bloodless. The patient should first be given a dose of morphine or pantopon scopolamine. If the wound is well to one side, it is better to make a fresh free incision in the midline and use the wound for drainage. Set operations should be avoided. If the wound is not sutured, if the dura has been opened, Carrel's method of after-treatment with the patient lying on one or the other side should be carried out. In cases which are retained in the casualty clearing station, the question presents itself as to whether suprapubic drainage of the bladder should be done. If operation on the spine shows that early improvement may be expected, it may be advisable to postpone drainage of the bladder. In any case if cystitis threatens, drainage is indicated. R. B. BETTMAN.



# GYNECOLOGY

## UTERUS

Miller, C. J., and King, E. L.: Use of Radium in Non-Malignant Uterine Hæmorrhage. *South. M. J.*, 1918, xi, 449.

Ten cases were classified as idiopathic and due to menopause. The youngest was a girl of sixteen, who had bled profusely for months; the others were from twenty-five to forty-six years of age. In all of them the bleeding had persisted for years. They had all been curetted from one to six times without relief; most of them had also been treated medicinally in various ways; one had had 23 and one 28 X-ray treatments. Nine of them were given intra-uterine radium treatments, the average dose being 1,000 milligram hours. In only one patient did the treatment fail to relieve the condition. In two other cases it was necessary to repeat the treatment.

Eighteen cases with chronic metritis and hypoplasia were treated. The patients ranged in age from thirty to fifty-five and most of them had suffered from bleeding for several years; generally menorrhagia first, and later metrorrhagia as well. Many of them gave a history of previous pelvic infection, most often puerperal in type. Dysmenorrhœa was the rule, accompanied by nervousness. Thirteen had been curetted from one to four times and 7 had had other operations on the uterus or adnexæ performed at the same time, all without relief. In every case radium treatment was followed by amenorrhœa. In two patients there was a recurrence of the bleeding about one year later, the flow being approximately normal. The others are still relieved. Six patients suffered from marked menopausal symptoms.

Twenty-six patients, between twenty-nine and forty-five years of age, were treated for fibroids. The tumors varied in size from small ones of a diameter of 3 to 6 cm. to one as large as a seven-months' pregnant uterus. Seventeen of these patients had been curetted, 2 had also had a myomectomy performed, and in 1 a small polypus had also been previously removed. Two had had X-ray treatments with temporary relief. In all of them a single radium treatment was, as a rule, sufficient to bring about amenorrhœa which is apparently permanent. In 10 cases a second application was made a month or so after the first to make assurance doubly sure. In one case there was a slight return of the flow, necessitating a second treatment eleven months later. One patient, treated in January, 1916, wrote four months later that she had not been much improved. Another case was operated upon successfully later. All the other cases have been entirely relieved by the treatment and in those that have been examined subsequently the uterus has been

found to be about normal in size, with the tumors one-half to one-third the original size and, at times, hardly perceptible. The dosage employed was at first 500 to 1,000 milligram hours. Later better results were obtained by the use of 1,500 to 2,000 milligram hours.

EDWARD L. CORNELL.

Oliva, L. A.: X-Ray and Radium in the Treatment of Uterine Fibromyoma (I raggi X e il radium nella cura dei fibromiomi dell'utero). *Gazz. d. osp. e d. clin.*, Milano, 1918, xxxix, 345.

The author has treated 35 cases, most of them at about the menopause, in which the tumor was not very large. In 25 there has been a total disappearance of the tumor, but only in 10 cases have two or more years passed since the last irradiation. Of the remaining 10 cases, 6 show an average reduction to about one-third the original size of the tumor, with persistent amenorrhœa; the other 4 show amenorrhœa but no reduction in the size of the tumor. Five of the cases were treated exclusively by roentgen rays with deep massive doses; 28 were treated with roentgen rays and radium; 2 by radium alone.

The author thinks irradiation should be the treatment of interstitial and intraligamentous fibromyoma of small volume in women who have passed the menopause or are approaching it. This treatment generally causes the tumor to disappear with persistent amenorrhœa. With the same type of tumor in young women, irradiation is not to be counseled because the massive doses necessary endanger the maternal function, while surgery often permits a simple enucleation of the myoma with preservation of the organs.

With subserous fibromyoma, especially if large, no matter what the age of the patient, surgical treatment is to be preferred because the action of the rays is very slow, hazardous to maternity in young women, and this kind of tumor, owing to its volume and compression exerted, calls for quick removal. Similarly submucous fibromyoma more or less prolapsed, no matter what the age, if complicated by other diseases calls for surgical treatment. Operation is usually easy, effective, and without danger.

Irradiation is indicated where surgery is contra-indicated on account of cardiopathy, nephritis, anæmia, etc. Six of the author's cases were of this type, and he remarks that anæmic patients tolerate irradiation very well if it is rapid and intensive. Finally, irradiation is effective in cases in which operation must be for any reason delayed, for instance, for a very large tumor or for the lesser anæmias. The hæmostatic and atrophying action of the rays in such cases is of the greatest benefit

inasmuch as it permits rehabilitation of the patient's general state, reduces the tumor, and warrants a more favorable termination to surgical operation.

W. A. BRENNAN.

**Bonney, V.: Myomectomy or Hysterectomy.** *Brit. M. J.*, 1918, i, 278.

In a discussion of the relative merits of myomectomy or hysterectomy, Bonney concludes that the practice of myomectomy should be considerably extended as an alternative to hysterectomy.

The main drawback to myomectomy is the continuance of menorrhagia. This may be due to: (1) a missed submucous fibroid; (2) endometrial thickening; (3) hypertrophy of the uterus; (4) degeneration of the uterine wall. Of these four conditions, the first three are usually part of the fibroid process, and the indicated treatment, namely, careful search for small fibroids, curettement, and trimming away part of the uterine musculature, should be resorted to. In a degenerative process of the uterus, if fibrosis rather than fibroids is the cause of hæmorrhage, hysterectomy should be done.

Usually reappearance of fibroids after myomectomy is due to small fibroids which have been overlooked, and is not due to new ones springing up.

The subject of future pregnancy after myomectomy is almost negligible, even though only ten per cent of women conceive after the operation. This view is taken from the fact that of those who come to operation many are over forty years of age, a good proportion of them are unmarried, and a large number are sterile married women. The danger of pregnancy after myomectomy and the uterine scar being unable to stand the strain is nil on account of the perfect healing of the uterine muscle.

The risk of the two operations is about the same, namely, hæmorrhage, but proper hæmostasis should eliminate this. Therefore myomectomy is the operation of choice except when fibroids are very numer-

ous and large, or when there is danger of overlooking some because of small size or location and consequent return of the condition. I. W. BACH.

**Rochard: Advantages of Total Abdominal Hysterectomy, Especially in Pelvic Suppurations** (Des avantages de l'hystérectomie abdominale totale, principalement dans les suppurations pelviennes). *Bull. Acad. de méd., Par.*, 1918, lxxxix, 356.

The author states that for a considerable time subtotal hysterectomy has replaced total hysterectomy. He believes this practice wrong and favors the total operation. It does not deserve the objections that have been made against it; and a cervix left *in situ* often becomes the site of epithelioma. In severe cases of pelvic suppuration the total operation gives effective drainage.

Since 1908 the author has carried out the total operation, which he divides into two stages. A subtotal hysterectomy is first done, which is followed by the secondary removal of the uterine neck. This he calls "subtotal hysterectomy totalized."

The author shows that the dangers which some authors declare connected with the total operation, i. e., hæmorrhage, injury to the ureters, shock, and infection, are easily avoidable. The difficulty of the operation, which was its chief drawback, has been obviated by thus dividing it into two stages and it becomes easy and rapid.

The author's statistics from February, 1917, to February, 1918, comprise 122 laparotomies. Among these there have been 68 hysterectomies for salpingitis, ovarian cancer, etc.; 48 were subtotal and 22 total. All these, as well as 7 other recent total hysterectomies, have given only 1 death.

The author practices total hysterectomy in two stages whenever the neck appears doubtful on palpation, whether the process is uterine or adnexial; also in double pelvic suppuration whenever the lower pelvis is involved.

W. A. BRENNAN.



# OBSTETRICS

## PREGNANCY AND ITS COMPLICATIONS

**Mussey, R. D.: Surgical Conditions Complicating Intra-Uterine Pregnancy.** *Am. J. Obst., N. Y.*, 1918, lxxvii, 806.

In the three years from 1914 to 1916 inclusive, there were more than 10,000 abdominal operations on women at the Mayo Clinic, and in that number 253 pregnant women were found to have definite surgical lesions not dependent on, though associated with, the pregnancy. Of these, operations were advised in 138 cases and performed in 123 cases. In the present study 23 of these are not considered because of lack of subsequent data confirming the diagnosis of pregnancy; thus 100 cases only are here reviewed. Of these the surgical conditions with respect to frequency occurred as follows: appendicitis, 57 times; cholecystitis and cholelithiasis, 26 times; fibroids, 3 times; adenoma of the thyroid and exophthalmic goiter, 4 times each; tumor of the breast, 3 times; inguinal hernia, 4 times; ovarian tumor, 5 times; duodenal ulcer, salpingitis, retroversion of the uterus, carcinoma of the breast, and exploration, twice each; ventral hernia, pyonephrosis with stone, ovarian and tubal abscess with stones in the common duct, cyst of the submaxillary gland, laceration of the perineum, abscess of the cheek, anal fistula, hæmorrhoids, tumor of the antrum, tumor of the parotid gland, osteomyelitis, sterility, and epithelioma of the arm, once each.

During the same three-year period there were 130 pregnant women with surgical complications who did not come to operation. In order of frequency the surgical conditions were: appendicitis and adenoma of the thyroid, 31 times each; fibroids, 17 times; gall-stones, 15 times; cholecystitis, 14 times; varicose veins, 5 times; hæmorrhoids and perineal lacerations, 3 times each; adenoma of the breast, exophthalmic goiter, salpingitis, cystocele and cervical laceration, twice each; ovarian tumor, cervical polyp, perineal relaxation, Hodgkin's disease, gastric ulcer, and tuberculosis of the spine, once each.

Mussey discusses these complications briefly and proposes the following conclusions:

1. Any operation which can be postponed should not be done during pregnancy.
2. When necessary, operations for appendicitis can be done without undue risk to mother and child.
3. It is rarely necessary to operate for fibroid tumors complicating pregnancy, but when operation is necessary, it is associated with little danger.
4. The removal of an ovarian cyst during pregnancy is less dangerous to the mother than is expectant treatment.

5. While the time most favorable for operation is believed to be in the first half of pregnancy, when necessary it can be done later.

CAREY CULBERTSON.

**Slemons, J. M.: Analysis of the Blood in Eclampsia and Allied Intoxications.** *Am. J. Obst., N. Y.*, 1918, lxxvii, 797.

The author considers as tenable the view that convulsions in pregnancy are due to some derangement of metabolism because the nitrogenous waste products of the urine are usually not only diminished but bear an abnormal quantitative relationship to each other. He accepts this view as a working hypothesis, notwithstanding the fact that urinalysis fails to supply a great deal of desirable information for the interpretation and the management of pre-eclamptic toxæmia.

As a further step in the study of this condition Slemons has turned to blood analysis and in the present article discusses consecutively the non-protein nitrogen and its components, the sugar, the fats and lipoids, and finally the alkalinity of the blood as measured by the carbon dioxide combining power of the plasma.

The results of his study are set forth in six tables, expressing results in detail. His conclusions are as follows:

1. Analysis of the blood in cases of eclampsia and allied intoxications reveals a normal quantity of amino-acids and a slight retention of nitrogenous waste products, as urea and uric acid.
2. After convulsions there is an increase in the blood-sugar.
3. The total fat is approximately the same in cases of toxæmia and of normal pregnancy. Usually the cholesterol is increased and the lecithin diminished in eclampsia.
4. The carbon dioxide combining power of the plasma is reduced during normal pregnancy, indicating a mild acidosis, and the variations met with in the presence of auto-intoxications are insignificant.
5. The results of blood analysis do not support the acidosis hypothesis nor the derangement of protein metabolism hypothesis of eclampsia and indicate that the cause of the disease must be sought elsewhere.

CAREY CULBERTSON.

**Zarate, E.: Spontaneous Hysteropexy in Repeated Cæsarean Operation** (Cesarea iterativa; hysteropexia espontanea). *Rev. argent. de obst. y ginec.*, Buenos Aires, 1918, ii, 20.

The most serious operative complication met with in a repeated cæsarean section is that arising from adhesions. Sometimes these are unimportant.

Sometimes the uterus is lightly fixed to the omentum and at other times it is rigidly held to an intestinal loop or fixed to the abdominal wall in such a way as to constitute a veritable spontaneous hysteroplexy.

On account of the positions which the uterus may assume, a repeated cesarean is often turned into an atypical operation. The classic technique cannot be followed; the conditions found suddenly confront the surgeon who must decide rapidly what course to follow in order to insure a satisfactory result.

Adhesions of the omentum to the uterus or the abdominal wall are the most frequent, occurring in about 60 per cent of cesarean cases. If the intestine is adherent, its liberation may require clever manipulation and sometimes even resection. The most dangerous class of adhesions are undoubtedly the uteroparietal. The uterus may be fixed in an irregular position and it may be greatly distorted. In one reported case the uterus had undergone a torsion of 90 degrees on its axis owing to adhesions.

The author reports a case of exceptional uterine deformity by uteroparietal adhesions. The patient was a woman of thirty-nine, a para-II, whose first labor had terminated by cesarean section. The parietal adhesions covered about three-fourths of the anterior face of the uterus involving all the left cornua and adnexa. The adhesions were so tough and resistant that they had prevented normal development of the greater part of the uterus, and this had taken part principally in the right cornua and posterior part, the posterior part of the lower segment being elevated to the height of the umbilicus. The scar of the original incision was dragged down into the Douglas pouch, its transverse position being changed into an oblique one in the posterior face.

This position of the uterus necessitated a diametrically oblique incision for the second cesarean which passed through the most vascularized part of the uterine wall. In addition, the difficulty of uterine retraction due to its parietal fixation rendered the checking of hemorrhage almost impossible; and owing to this and the patient's condition the author was obliged to perform an immediate hysterectomy after delivery of the child. The woman left the hospital well at the end of forty days and the child then weighed 5,700 grams.

W. A. BRENNAN.

**Bacon, C. S.: Feeding in Hyperemesis Gravidarum.**  
*J. Am. M. Ass.*, 1918, lxx, 1750.

Rectal feeding remains the most practicable method and, when properly given, is efficient.

The cleansing enema may be given early in the morning, at 7 or 8 o'clock. Then the nutrient enemas should start about 9 a.m., 2 p.m., and 7 p.m. Sometimes it will be found desirable to add ten drops of tincture of opium to the evening enema.

The composition of the rectal feedings should have about the following proportions: glucose, 50; alcohol, 50; calcium chloride, 0.3; sodium bicarbonate, 3; sodium chloride or bromide, 4; vitamin, as much as is sufficient; distilled water, enough to make 1,000. From 300 to 500 gm. are to be given three times a day. This mixture has an energy value of about 550 calories. If 1,500 ccm. are given each day, the patient will receive 825 calories. In two or three days the retching stops, the thirst disappears, and the patient is in a fairly comfortable condition. The great nitrogen loss is stopped and the total nitrogen output in the urine is often reduced to 3 gm. in twenty-four hours. The ratio of the ammonia nitrogen to the total nitrogen also falls, although it may still remain more than twenty per cent.

It now becomes a difficult task to determine when stomach feeding may begin. As a rule, it is better to be cautious than hasty. The returning appetite of the patient and her confidence in herself is at times a guide. If the pregnancy is approaching the fourteenth week and the uterus is raising out of the pelvis, the mental change is often remarkably sudden. Likewise in markedly neurotic patients, the cures are often sudden. Lavage of the stomach is frequently very desirable before beginning oral feeding. The foods best taken are generally some forms of milk, such as peptonized milk, malted milk, and buttermilk. Egg albumin is added early. Rectal feedings are discontinued gradually and not until the stomach feeding is re-established. Even when the patient has recovered completely, she should be kept under control until the sixteenth or the eighteenth week, as discouraging relapses are not uncommon.

EDWARD L. CORNELL.

**Gentili, A.: The Relation of the Hypophysis to Increased Diuresis and to the So-Called Diabetes Insipidus of Pregnancy** (*L'ipofisi in rapporto all' aumentata diuresi ed al cosiddetto diabete insipido della gravidanza*). *Ann. di ostet. e ginec.*, Milano, 1917, xli, 173.

The author describes the case of a para-V aged forty years who was in good health in spite of having had attacks of malaria and pneumonia. The gynecological history showed one febrile puerperium and two others with delayed recovery. In her last pregnancy from the sixth month there was marked polyuria (5,000 to 6,000 gr. of urine in twenty-four hours) of low density but not containing abnormal constituents; also polydipsia, weariness, insomnia, and abundant metrorrhagia. From the seventh month there were signs of osteomalacia with a beginning skeletal deformation. The general state steadily declined, with loss of weight, persistence of the polyuria, and accompanying phenomena notwithstanding attempts at treatment with hypophyseal extract which only effected a temporary improvement. Labor was induced at the end of the eighth month by the Krause method, a slight inertia



during the expulsive period being overcome by pituitrin injection. The fetus was alive and the postpartum period normal. The polyuria gradually diminished to about one liter of urine in the twenty-four hours, being normal in density. The osteomalacia also gradually diminished.

The author discusses the case at length, quoting opinions expressed by various authors on the subject. He concludes from his study that the syndrome described, especially the form of the so-called diabetes insipidus of pregnancy has its origin in functional disturbances principally in the hypophysis. As it has been clinically demonstrated that there is a direct or indirect relation between the phenomena of diabetes insipidus, apart from pregnancy, and alterations of the hypophysis, it is reasonable to regard the forms of diabetes insipidus manifested during pregnancy and ceasing with parturition as due to an exaggeration of the well known anatomic and functional alterations of the gland in maternity.

During pregnancy the hypophysis, owing to great functional adaptability, transforms cells of the anterior lobe into well differentiated elements. This answers perhaps to the call for new hormones to meet changed conditions in the organism. The differentiated cells disappear or become reduced when such new needs have ceased. But by such action the endocrine relations of the anterior lobe with other parts of the hypophysis and other glands of the same group are probably changed.

The relative insufficiency of the posterior hypophyseal lobe is almost normal in pregnancy; it causes urinary modifications during this period and it is more marked in the last period of gestation and in multiparæ. If this insufficiency is accentuated by pre-existing modifications in the hypophysis, by preceding alterations in the endocrine inter-relationship, there may occur during pregnancy a true diabetes insipidus which will cease after birth, though perhaps giving phenomena at recurrent menstrual periods.

In the same way may be explained the accentuation of pre-existing polyuria during pregnancy and the return to normal condition in the puerperium.

From the facts stated, the cause of this polyuria being known and the accompanying polydipsia arising during pregnancy and ceasing afterward, it is right that it should be removed from the group of idiopathic forms and classed under the name of polyuria diabetes insipidus of pregnancy.

W. A. BRENNAN.

**Emge, L. A.: Further Observations on Acidosis in Pregnancy.** *Am. J. Obst.*, N. Y., 1918, lxxvii, 813.

In 1916 the author reported his investigations of the carbon dioxide tension of the blood of 68 normal uterine pregnancies, finding that there was normally an acidosis of varying degree which disappeared shortly after parturition. The material of the present study comprises 21 cases of various toxæmic disturbances in pregnancy and 10 normal menstruating women, divided into four groups, namely,

(1) eclampsia and pre-eclamptic toxæmias; (2) nephritis of pregnancy; (3) excessive vomiting of pregnancy; and (4) normal menstruation. Details of these present investigations are set forth in four tables.

The author presents his conclusions as follows:

1. Menstruation does not alter the alkaline balance of the blood in normal women, as shown by the carbon dioxide.
2. Labor increases the acidity of the blood by reason of the attendant muscular exertion.
3. The acidity of the blood in eclampsia increases in proportion to the severity and number of convulsions, again pointing to the influence of muscular exertion.
4. The acidosis of the toxæmias of pregnancy is usually only equal to that noted in normal pregnancy.
5. Anæsthesia and starving both depress the carbon dioxide content of the blood.
6. The blood collected in open tubes will give lower carbon dioxide readings than that collected under oil.

CAREY CULBERTSON.

#### LABOR AND ITS COMPLICATIONS

**Brindeau, A.: Combined Rupture and Inversion of the Uterus** (Rupture et inversion utérines combinées). *Arch. mens. d'obst. et de gynéc.*, Par., 1917, vi, 195.

The patient was a woman aged thirty-two years, a para-VII. The first five labors were normal, the sixth difficult with instrumental delivery. At the end of the seventh pregnancy there was a spontaneous rupture of the uterus. An immediate laparotomy was done. The fetus was found among the loops of small intestine, and was easily extracted. The placenta herniated outside the wound and the uterus was inverted. Hysterectomy was done.

On examining the removed uterus, it was found to be completely inverted above the tear so that the internal surface became the external and the peritoneal face was internal. The tubes and round ligaments had penetrated through the rupture and become internal. The uterine rupture was on the left ledge nearer the posterior than the anterior face. Microscopic examination of the tear showed that it was in cicatricial tissue in the midst of which there was some necrosed muscle fibers. Further examination showed obliteration of the internal orifice of the cervix. The woman made a complete recovery.

The history of a previous difficult labor with a probable rupture of the lower segments accounts for the rupture occurring in cicatricial tissue. This tissue was only about 1 mm. thick, and the distention and first contractions of labor were sufficient to cause rupture.

It is not so easy to explain the obliteration of the internal os. It is difficult to say whether or not the obliteration was complete. How did fecundation occur? The author thinks it possible: (1) that the cicatrization may have continued during pregnancy

and that the internal orifice may have been engulfed in the process; or (2) that obliteration was apparent only and that the tissues of the inferior segment in time obliterated the lumen of the cervix in the superior part. In any case it seems that there was a pathological process beginning before fecundation and continuing during pregnancy. The woman probably became pregnant before the cicatrization of the old scar was complete.

The placenta was inserted about 2 cm. above the tear where the uterine wall was very thin. All the portion of the uterus above the tear was inverted. The author traces the inversion originally to uterine inertia which was very marked in this case.

W. A. BRENNAN.

**Kouwer, B. J.: Old Primiparae; Connection Between the Age and the Mode of Labor in Primiparae** (Les primiparae âgées; relation entre l'âge de la femme et le mode d'accouchement chez les primipares). *Arch. mens. d'obst. et de gynec.*, Par., 1917, vi, 207.

Kouwer of the Obstetrical Clinic of Utrecht gives a number of very interesting tables and statistics concerning pregnancy and labor of primiparae. He has made a personal study of labor in old primiparae based on the observations of 5,300 labors observed at Utrecht from 1900 to 1916, and a study of the literature. He finds that:

1. The duration of labor increases with the age of the primipara. The cause is the diminution in the contractions. The number of forceps applications increases in the same proportion.

2. The influence of age begins to become manifest from the twenty-fourth year.

3. The phenomenon is probably the consequence of functional weakening of all the organs. This weakening includes the endocrine glands acting on the uterus which cause modifications during pregnancy. This weakness is itself due to retarded physiological development of the feminine organism. The hypothesis seems to be strengthened by the increased frequency of uterine inertia, gravid albuminuria and eclampsia starting from the twenty-fourth year.

Some of the results shown in Kouwer's statistics are as follows: Regarding the duration of labor, the average is as follows; age twenty years, 15.0 hours; twenty-four years, 16 hours; thirty to thirty-seven years, 38 hours; with a steady increase from the twenty-fourth year.

Regarding extraction by forceps, the average is age twenty years, 5.4 per cent; twenty-four years, 7.5 per cent; thirty to thirty-seven years, 21.3 per cent; thirty-eight to forty-seven 34.3 per cent.

Eclampsia increases from 0.86 and 1.81 per cent at ages twenty and twenty-four years respectively to 3.33 per cent between the ages of thirty-eight and forty-seven years.

Albuminuria increases from 12.3 to 21.5 per cent at twenty and twenty-four years respectively to 34.2 per cent at thirty-eight to forty-seven years.

W. A. BRENNAN.

## PUERPERIUM AND ITS COMPLICATIONS

**Haugh, E.: Postpartum Eclampsia** (L'éclampsie après l'accouchement). *Arch. mens. d'obst. et de gynec.*, Par., 1917, vi, 224.

In the Rigshospitalet of Copenhagen during the past six and a half years, among 8,600 deliveries 140 cases of eclampsia were observed. Of these only 19 were postpartum, or 13.6 per cent. Haugh has not observed that age influences the progress of the disease, neither does the time of onset of labor. Among the important symptoms, from the point of view of prognosis, Haugh refers to the marked diuresis, attaining 3,000 or 4,000 ccm. per day, which occurs from the time the patient begins to recover.

The author reviews the various methods of treatment. He thinks the most rational treatment is that which has the elimination of the eclamptic poison for its object. It is preferable to neutralization. This elimination of toxins may be either through the kidneys, by the intestines, or by bleeding. In his own service Haugh immediately administers 35 to 40 gr. of castor oil, preceded by lavage of the stomach. He has seen several cases greatly improved after one or more purges.

Haugh traces the history of venesection in connection with eclampsia which was practiced as far back as 1670 by Mauriceau. In his own cases Haugh has practised it 10 times, removing quantities of blood varying from 450 to 1,000 ccm. The ulnar vein was always used and the method was only resorted to in very serious cases. In 7 cases, in which from 600 to 1,000 were withdrawn, the convulsions ceased at once. The other cases did not give such rapid results.

Much has been written to the effect that the prognosis of this form of eclampsia is very bad; the author has found the contrary to be the case. He submits a tabular statement of authors who have compiled statistics comparing this form of eclampsia with other forms. Eleven authors show a lesser mortality and only three a greater mortality in postpartum eclampsia than in other forms. All of Haugh's cases recovered.

W. A. BRENNAN.



# GENITO-URINARY SURGERY

## KIDNEY AND URETER

**Green, R. H.:** *The Present Status of Renal Tuberculosis.* *Internat. J. Surg.*, 1918, xxxi, 151.

Previous to the war, Green claims that renal tuberculosis was studied in a conscientious and scientific manner, but since then the war has acted as a deterrent to scientific research along these lines.

The author claims that unless there are marked symptoms of septicæmia in some form, renal tuberculosis should not be treated by operative procedures; but if marked septic conditions are present, they may be so imperative as to require surgical intervention.

The mental as well as the physical condition of the patient needs careful attention. Cystoscopy should be performed with unusual care, and ureteral catheterization should not be attempted unless indications for its employment are very urgent. The author follows the method of Eckford of X-raying the inoculated guinea-pig, thereby increasing its susceptibility to tuberculosis, and obtaining a diagnosis in two weeks.

As to therapy, Green advises the use of a vaccine which has proven of some value in inoperable cases; for tuberculous cystitis he recommends irrigations of one part of ichthyol to five of water. In septic cases the problem is a difficult one; if it can be definitely determined that the condition is confined to one kidney alone, the problem is more simple. When circumstances permit, one or two months in the mountains is very beneficial, but this failing, a nephrectomy, with the removal of as much of the ureter as is practical, should be performed.

Where both kidneys are found to be involved, together with a high degree of sepsis, an exploratory operation should be performed, both organs examined and operative procedures then instituted as circumstances seem to indicate. LOUIS GROSS.

**Pepper, O. H. P.:** *Functional Tests of the Kidney in Diagnosis and Prognosis.* *Penn. M. J.*, 1918, xxi, 575.

The author calls attention to the difficulties in determining accurately renal function because of the complexity of the process, the gaps between theories and facts as to renal secretion, and misinterpretation of function testing due to extraneous factors.

The kidney is chiefly concerned with the elimination of water, nitrogenous waste and sodium chloride. Along each of these lines functional tests have been applied. These separate tests of kidney ability may be combined and the results observed in conjunction with studies of the blood. The estimation of blood urea nitrogen is most commonly employed. Estimation of the sodium chloride of the

blood is not difficult but has only a limited application.

The remaining group of tests is based upon the elimination by the kidney of some foreign substance of which the rate and quantity of secretion can be measured, i.e., lactose, potassium iodide, methylene blue, indigo carmine and phenolsulphonphthalein.

Of the various tests mentioned, four are of especial usefulness: (1) the testing of the ability of the kidney to eliminate water and to dilute or concentrate the urine; (2) the elimination of salt test; (3) the estimation of blood urea nitrogen; and (4) the phthalein test.

Diagnosis may be considered from four points of view: (1) The test may give information concerning the kidney ability to perform a given function; (2) an estimate of the degree of renal impairment by nephritis may be attempted from one or more tests; (3) an estimate of the patient's condition at the moment may be obtained; (4) an attempt may be made to draw conclusions concerning the anatomical lesion in the kidneys. The phthalein test is in all respects the best all-around test of renal function.

The water test, the chloride elimination and the phthalein merely tell the state of the kidney function at the moment. The blood urea nitrogen tells more, in that it gives evidence of the degree to which the body is being poisoned by retained products. For prognostic aid, most cases will require a repetition of several functional tests in order to ascertain the direction of change.

An increasing blood urea nitrogen or a decreasing phthalein is very significant and a high urea nitrogen with a very low phthalein seldom persists long without the development of uræmia. In the control of treatment the functional tests must be repeated at intervals to obtain the best results.

The author in conclusion emphasizes the importance of excluding extrarenal factors and of always interpreting the tests in conjunction with routine study of the urine, the blood-pressure, and the patient. H. G. HAMER.

**Stengel, A., Austin, J. H., and Jonas, L.:** *A Comparison of the Functional and Anatomic Findings in a Series of Cases of Renal Disease.* *Arch. Int. Med.*, 1918, xxi, 313.

The authors present the results of a careful study of 30 cases of renal disease, 15 of which came to autopsy. The tests applied consisted of estimation of hæmoglobin, blood-pressure, phenolsulphonphthalein output, blood urea nitrogen, non-protein blood nitrogen, plasma chlorides, plasma bicarbonates, urinary specific gravity, and observations of the eye-grounds. They summarize the study as follows:

1. The cases of acute nephritis showed a pronounced impairment of all the renal functional tests.

2. The cases of advanced chronic glomerulonephritis showed, in the most pronounced degree, elevation of blood-pressure, depression of phenolsulphonaphthalein excretion, elevation of blood urea or non-protein blood nitrogen, fixation of urinary specific gravity, and the presence of albuminuric retinitis.

These cases were characterized, however, by a normal or even a definitely subnormal plasma chloride level, and by a considerable reduction of the plasma bicarbonates.

Those cases which exhibited marked tendency to proliferative changes in the glomerular tufts were characterized, as a rule, by higher blood-pressure than the cases which exhibited chiefly hyaline changes in the tufts.

3. The cases which might have been classed clinically as chronic parenchymatous nephritis or as nephroses because of the very slight elevation of blood-pressure, the less marked depression of phenolsulphonaphthalein, the less marked elevation of non-protein nitrogen and the more nearly normal urinary specific gravity, and because they exhibited conspicuous oedema, especially of the face, and abundant albumin and casts of all kinds in the urine,—these cases were less definitely characterized histologically than had been expected. While it is true that they showed pronounced degenerative or necrotic changes in the tubular epithelium, they also showed conspicuous, even advanced glomerulonephritis. Histologically, their separation from the clinical group of advanced glomerulonephritis would have been difficult, perhaps impossible. Grossly, the kidneys in these cases were identical with those of the other group just mentioned. The authors prefer to call these cases simply "chronic nephritis" without further qualification.

The plasma chlorides were elevated in the two cases of this group studied in this connection.

4. The cases which clinically and histologically were cases of renal arteriosclerosis exhibited a variety of forms of kidney grossly and could not have been properly classified on gross appearance alone. The blood-pressure, and especially the pulse-pressure, although much above normal, were usually lower than in cases of advanced glomerulonephritis.

The plasma chlorides and plasma bicarbonates were normal or approximately so.

5. In all cases with elevation of blood-pressure, some fall of pressure was noted in the last five or ten days before death. Contrary to expectation, however, the fall in diastolic pressure was closely proportional to the fall in systolic pressure, and not less, as might be expected. GILBERT SMITH.

**Fitz, R.: The Urea Index as a Test for Kidney Function in a War Hospital.** *J. Am. M. Ass.*, 1918, lxx, 1755.

The author has observed nephritis in Base Hospital No. 5 with McLean's urea index as a kidney

function test. An absolute adherence to McLean's directions with the determination of urea in the blood and urine by the urease method was followed out. He found it necessary to use an aspirating pump where water suction was not available. The normal solutions were kept in tightly stoppered flasks from which the dilutions were made to N/50 and N/100 solutions in calibrated flasks. Every week the normal solutions were checked.

The entire time of the test was only seventy-two minutes for the period and seventy minutes for the completion of the analyses. McLean's special calculating device is used on a ten-inch slide rule; or the calculation could be done by logarithms.

The prognostic value of the test is demonstrated by the report of cases as examples of the satisfactory application in a tent hospital.

The author states that the disadvantages of the phenolsulphonaphthalein test, the excretion of which strikingly parallels the urea index, were that with uncertain asepsis the intramuscular or intravenous treatment should be used as little as possible. The urea index is performed with a slight needle drawing 3 ccm. of blood, which can be done several times in a day.

H. W. PLAGGEMEYER.

**Martin, P.: Indigocarmine Used Intravenously for Locating Ureteral Orifices in Tuberculous Cystitis.** *Med. Rec.*, 1918, xciii, 808.

The tubercle bacillus may reach the bladder by three routes: first, along the walls of the ureter secondary to a renal tuberculosis; second, along the walls of the vas deferens secondary to a tuberculous epididymitis; third, direct from the blood stream primary.

Microscopically changes appear as follows: Tubercle bacilli are deposited first in the submucous tissue spaces and produce hyperæmia exudation and proliferation of round and spindle cells with the formation of miliary tubercles. These coalesce, undergo necrosis, and give rise to submucous collections of yellow, cheesy material. The epithelium on top of this area then undergoes necrosis and disappears, leaving the cheesy material to be discharged into the bladder so that an ulcer is formed, the floor and edges of which are lined with tuberculous granulation tissue.

The disease may begin suddenly with frequency in urination and burning pain during micturition, or it may be so gradual in onset that the patient is unable to recall when the trouble first began.

In the early stages of the disease, there are as a rule no general symptoms such as pyrexia, loss of weight or anæmia, and the patient may appear healthy and well. Later, however, after the onset of secondary infection or of very extensive ulceration of the whole urinary tract, cachexia, and hectic temperature may be present. In these later stages the suffering is constant from the frequent agonizing calls of the bladder to empty itself. This may also be a factor in the rapid loss of weight.

In cases of tuberculosis of the bladder secondary



to a renal tuberculosis or secondary to a tubercular epididymis the first symptoms may start with an irritable bladder, followed by pyuria and often hæmaturia.

The finding of the tubercle bacillus in the urine accompanied by pyuria or other local symptoms and signs will tend to confirm the diagnosis of tuberculous cystitis. In any doubtful cases examination is then made by stained films of centrifuged urine, and the diagnosis based upon finding acid-fast bacilli should be further confirmed for tuberculosis by guinea-pig inoculation.

If the infected kidney or testicle and vas can be removed in the early stages, the bladder appears to be able ultimately to overcome the infection, if reinfections are prevented.

With the aid of the cystoscope it is possible to ascertain accurately whether one or both kidneys are infected, or what the functional power of each is.

In diffuse tuberculous cystitis, when the bladder has become greatly reduced in size and the slightest movement of the inserted cystoscope causes the entire cystoscopic field to become bloody, it is by no means an easy matter to locate either ureteral opening even though one kidney is normal. It is in this type of cases that the employment of indigocarmine intravenously may prove of great value by causing a blue spurt of urine to appear from the ureteral orifices against a diffuse red background and thus act as a target at which to direct the ureteral catheter.

In tuberculous cystitis, when there is difficulty in locating the ureteral orifices the following procedure is recommended. Inject 2 ccm. of a saturated solution of indigocarmine into one of the veins at the bend of the elbow after the cystoscope has been used for inspection of the bladder, and while it is still in place. The region of the trigone is then kept under observation for the appearance of the blue color. The time of appearance of the dye on each side may be recorded. The catheters are then passed into the ureters and specimens collected for microscopic study. The dye as a rule will appear in the urine in from two to twelve minutes after the injection.

The author cites four cases of tuberculous cystitis where he used indigocarmine to locate the ureteral openings, and the phthalein functional test to ascertain the renal function.

Indigocarmine is soluble in water, 0.8 per cent, and is of a dark blue color. Its reaction to litmus is neutral and it can be sterilized by boiling or by steam pressure.

The behavior of indigocarmine toward sodium hydrate makes it possible to bring out the characteristic red of phthalein by adding sodium hydrate, which at the same time causes the blue color to disappear. Thus the phthalein functional test may be employed satisfactorily after using indigocarmine to locate the ureteral orifices. It has been noted that when a stronger suspension of the dye is injected intravenously, transitory symptoms of shock

varying from mild manifestations, such as dizziness and pallor, to complete collapse will occasionally occur.

These manifestations may possibly be due to the action of undissolved particles of the dye as momentary thrombi. For this reason the dye should be used intravenously only when in complete solution and carefully sterilized. THEO. DROZDOWITZ.

## BLADDER, URETHRA, AND PENIS

**Blakeway, H.: Hernia of the Urinary Bladder; Notes of Cases, with Remarks on Strangulation of Femoral Herniæ and Its Treatment.** *Lancet*, Lond., 1918, xciv, 799.

Hernial protrusion of the urinary bladder is a comparatively uncommon complication of inguinal and femoral herniæ. Diagnosis cannot usually be made before operation, though symptoms and statements of the patient may suggest it.

This difficulty of diagnosis and its rarity have led in many cases to injury to the bladder during operations for relief of hernia.

The author has operated upon five cases of hernia in which the bladder protruded. Three were males and two females. The ages varied between forty-eight and seventy-one years. All were of long standing and in four strangulation was present. All were on the right side, of the direct inguinal variety in two of the males, and of the femoral type in the other three cases. A sixth case was seen in which diagnosis was made without operation.

In all the cases operated upon, the relative position of the sac and the herniated process of the bladder were similar. The bladder protrusion in all cases involved the whole thickness of the bladder wall. It was closely applied to the inner side of the neck of the sac, and in each case was about the size of a walnut. At operation it was always found collapsed and might easily have been accidentally wounded or ligated.

Any thickening about the inner side of the sac of an inguinal or femoral hernia, especially if of long standing, should excite suspicion. H. G. HAMER.

**Broun, L., and Rawls, R. M.: A Cystoscopic Study of the End-Results of Various Forms of Cystocele Operations.** *Surg., Gynec. & Obst.*, 1918, xxvi, 502.

In this paper the authors report the result of their study of the end-results as to the condition of the interior of the bladder in patients who had undergone some form of cystocele operation. A series of 50 ward cases comprises the material for this study. There was no selection of cases, and they were taken from the service of every operator in the hospital. All patients had been operated upon at least one year previous to examination. A uniform dilatation to 300 ccm. was adopted for the cystoscopic study. The results may be briefly summarized as follows:

Only one patient complained of increased urinary symptoms following an interpositional operation.

With this exception, in none of the patients examined were the urinary symptoms aggravated by the operation, while in the majority such symptoms were relieved. This is striking, since only 9 of the 49 patients examined showed a normal bladder base.

The cases are grouped as follows: In 12 the plane of the bladder base was normal. In 8 the bladder base was thrown into deep horizontal folds of a varying degree of prominence. In some patients of this group there was displacement of the ureter mouths, and a mild trigonitis was a frequent accompaniment. In a third group of 8 cases the folds of the bladder base were transverse. The folds were fixed and could not be made to disappear under full dilatation. A final group comprises those patients in whom the uterus was interposed between the bladder and the vaginal layers, 10 cases. The ureteral openings were displaced in every instance and often located with difficulty. Trigonitis was the rule.

This study discloses the fact that in the majority of operations for cystocele permanent changes in the bladder base result. These changes are fixed. There was no constant change associated with any particular type of operation. While there are few symptoms produced by the abnormal condition at the base of the bladder, the query is raised whether or not more serious systemic changes may ensue as a result of the distorted and displaced ureteral orifices.

The extent of the folding and formation of sulci in and around the bladder base depends upon the degree of freedom of the separated bladder from the underlying mucosa and fascia and also from the uterus. The authors hope that by further study they may establish the essential features of the operation that will not only give a permanent vaginal restoration of the prolapsed anterior wall, but also in so doing will leave the bladder base in its normal plane.

H. A. FOWLER.

**Pedersen, V. C.: The Urethroscope; an Outline of Its History and Development of Its Types.**  
*Internat. J. Surg.*, 1918, xxxi, 185.

Endoscopy, correctly termed urethroscopy, is in rudimentary form a century old. The first crude instrument was devised by Bozziny of Frankfort in 1805, then Segalas of Strassburg in 1826, Fisher of Boston in 1827, Avery in 1843, and Cazenave of Paris in 1848, each added improvement. Contemporaries were Hacken, Bombalini, and Desormeaux in 1853. The latter developed the idea of Fisher and received a part of the Argenteuil prize in 1853 in Paris as the first award for scientific work in this field. His instrument is the first attempt at a serviceable urethroscope. Since this time much work has been done in Europe and the United States toward developing a urethroscope available alike for diagnosis and treatment. In Europe, Hacken in 1862, Cruise in 1865, Andrews in 1867, Fuerstenhaim in 1870, Stein in 1874, and Gruenfeld of Vienna in 1874 have all added their portion of advance. In the United States the extrinsic illumination, non-

dilating, non-irrigating urethroscope has reached its highest development in the instruments of Squier of New York in 1912 and of Young of Baltimore in 1909, which add the element of a magnifying lens.

The Squier urethroscope has an efficient light carrier so arranged that a strong light is focused in the tube, leaving practically the entire caliber free for observations and applications. It is also fitted with a small magnifying lens, which may be swung into position without obstructing the tube. The carrier has switch and cord, giving instant control of the light.

The instrument described by Young of Baltimore in 1909 in the following terms is an extrinsic illumination, air dilatation, terminal fenestrum, observation and operation urethroscope. The light carrier rotates upon a post by which it is attached upon the urethroscopic tube. A small reflector in front of the left half of the lens throws more light into the urethroscopic tube and keeps it off the outer plate, and thus prevents the blinding reflection on this plate seen in some other urethroscopes. The obturators are a special form, so as to make the withdrawal easier with the light carrier in position. The tubes are made of pure silver so as to prevent the corrosion produced by nitrate of silver which is so extensively used, and also to afford a better internal reflecting surface, thus increasing the mural reflections and giving better light in the urethra. It is made in sizes 26 to 28 F., straight tube length.

The limitations of extrinsic illumination urethroscopes outweigh the advantages, which are: (1) a full lumen for the use of instruments, without interference by the presence of a light carrier; (2) a large field which is identified with the large lumen and likewise afforded by the absence of the light carrier.

The disadvantages of extrinsic illumination urethroscopes are, as just stated, more important than the benefits, and include: (1) deficient illumination, because light varies inversely as the square of the distance; (2) light strong enough to overcome this physical loss casts reflections from the telescope and confuses the eye; (3) restricted definition through the limited light and the reflections; (4) difficulty of centering the rays except in such modern instruments as those of Squier and Young; (5) the eye of the observer must maintain constant relation with the movements of the patient; (6) the lamps attached narrow the lumen for instrumentation and must be removed out of the axis of the sheath accordingly, even in modern instruments.

Transition to intrinsic illumination was the next advance. The possibilities of urethroscopy, as shown in the Gruenfeld type, stimulated work everywhere and others added to the foundations already laid in ways which space forbids to detail. Such pioneers were Nitze, Oberlander, Von Antal, Schutze, Casper, Leiter and Luys in Europe, and Otis in this country, who with the exception of Fisher of Boston in 1826, appears to have been the American innovator in this field.



The Luys urethroscope is of the intrinsic illumination, non-dilating, non-irrigating, magnifying type and therefore is a distinct advance. It represents one of the best modern European instruments and has been improved in this country by McCarthy.

Otis was followed by Valentine in 1899, who produced the first cold lamp instrument. In rapid succession the urethroscope was improved in this country by Otis, Chetwood, Hayden, Squier, Buerger, McCarthy, and Mark, who all made progress. In women Kelly and Pryor have added to the development. Photography had not been employed in urethroscopy until Koleman in 1891 adopted a photographic outfit to the Valentine instrument. The Valentine urethroscope brought intrinsic illumination to its full development but left the fields of magnification, dilatation, and irrigation uninvaded.

Swinburne of New York in 1900 produced a posterior urethroscope of the intrinsic illumination, non-dilating, non-irrigating, terminal fenestrum, magnifying type with a short curved beak. The field is magnified by a double curved lens, which may be rotated out of the axis of the sheath during instrumentation. The tubes are made 22, 24 and 26 French. The instrument is complete with one posterior tube and obturator, light carrier, lamp and cord.

The Pederson instrument is the same as the Chetwood except that the sheath is lightly and clearly marked into centimeters or into inches and half inches. These scales are very serviceable in locating and relocating lesions which require treatment. It is an intrinsic and an extrinsic illumination instrument. The author shows complete drawings of the different types of urethroscopes.

THEO. DROZDOWITZ.

**Dabney, M. Y.: Cancer of the Penis; Report of a Case.** *South. M. J.*, 1918, xi, 443.

The author states that cancer of the penis seems to occur more rarely than the meager statistics would indicate. Its etiological factors in the order of their importance are phimosis, venereal sores (especially chancre sites), and trauma. The presence of moderate glandular involvement is no contra-indication *per se* to operation, first, since the tendency to distant metastases is not so marked as in cancer elsewhere in the body; and second, since infection, which invariably accompanies broken-down cancer, may be responsible for the lymph-node enlargement. Certain very early cases are often cured by simply amputating the distal third or half of the penis.

The best chances of cure lie in early radical operation, including the extirpation of the penis, the removal of the superficial and deep inguinal lymph-nodes, those in the femoral canal and vicinity, and those in the pubic region.

Castration permits of a more thorough dissection of the deep inguinal glands, and in some cases is more humane to the patient. However, his wishes

should be consulted in the matter. A tight tourniquet between the growth and the point of amputation or extirpation during operation should lessen the chances of metastases from manipulation.

A metal sound as a guide introduced into the urethra and passing a malignant growth is unwise, as it may carry cancer cells and thus transplant them in areas of traumatic abrasion from the sound. Instead a nick should be made in the urethra proximal to a tourniquet and the sound then passed.

V. D. LESPINASSE.

## GENITAL ORGANS

**Syms, P.: Perineal Prostatectomy.** *Internat. J. Surg.*, 1918, xxxi, 165.

Syms contrasts the relative merits of the perineal and suprapubic operations of prostatectomy.

He claims that the perineal method is far safer than the suprapubic, that the operation can be performed more speedily through the perineal than the suprapubic route and that convalescence is more brief and more comfortable.

From an anatomical viewpoint the author claims there can be no doubt as to the superiority of the perineal route, as the prostate lies in the perineum and not in the abdomen. From a surgical viewpoint the perineal is also superior as it violates no surgical principle; it results in the least possible mutilation. The bladder is not injured, the wound is an open one of the simplest type, drainage is in the line of gravitation, and the entire wound can be opened, inspected, and treated.

Although Syms was one of the first to employ the two-stage principle in this branch of surgery, he does not use it as a routine procedure.

LOUIS GROSS.

**Lydston, G. F.: True Senile Prostate Associated with Multiple Sacculi of the Bladder.** *Illinois M. J.*, 1918, xxxiii, 250.

The true senile prostate is atrophic and is not productive of symptoms; when associated with fibrosis of the internal sphincter, sacculi of the bladder or with calculi, conditions are widely different. Although frequency of urination and cystitis are usually attributed to the prostate merely because the patient is senile, they are in no wise due to pathologic conditions of that organ, except to the prostatic urethra which may be secondarily infected or traumatized by calculi or by instrumentation.

The author reports a case of a patient aged sixty-eight who for four years had frequent and difficult urination. A diagnosis of enlarged prostate had been made and use of the catheter instituted. Catheterization became difficult and was abandoned. Several months later the author found the prostate atrophied and the bladder sacculated. The internal sphincter was rigid and hypertrophic, the bladder wall degenerated and atonic. There were 29 ounces of residual urine. Suprapubic section and division of the fibrous ring at the vesical orifice was performed.

The wound was closed by the end of the fourth month. Incontinence continued for eight months with gradual improvement. Death occurred three years later from uræmia superinduced by nephritis complicating la grippe.

The author regarded this case as one of congenitally defective development of the bladder wall predisposing to sacculation, as senile changes were added to the primary defect in vesical structure and tonus.

The secondary changes in the vesical sphincter are added to the changes in the vesical wall. Under such conditions a normal sphincter would produce relative obstruction. A normal sphincter resistance with defective vesical tonus is as likely to result in retention as a pathologic obstruction associated with a normal or exaggerated tonus.

There is a disturbance of equilibrium between the expulsive power of the bladder and the resistance of the vesical neck in both conditions.

H. G. HAMER.

**McGowan, G.: Surgery of the Prostatic Urethra and the Bladder Neck.** *Northwest Med.*, 1918, xvii, 159.

The most frequent cause for surgical interference with the posterior urethra is retention of urine, following some degree of enlargement of the prostate gland or some deformity, usually inflammatory in origin, of the bladder neck. Aside from the removal of obstruction to the exit of urine there are a number of other conditions which demand interference and which are susceptible to care if the surgeon possesses the instruments necessary for diagnosis, knows how to use them, and has at his command the instruments required for successful therapeutic applications or operations.

One of the most frequent causes of unsatisfactory results following operations for the removal of hypertrophied prostates is that of overlooking growths upon the anterior surface of the urethra. In the prostatic urethra one has to deal with a mucous membrane and the direct group of glands which belong to it, with numerous ducts which drain the acini and which open principally on the floor of the urethra midway between the two vesical sphincters.

The verumontanum which is in the center of the prostatic urethra is perhaps more abundantly supplied with nerves of special sensation than any other portion of the body, is a rich field for pathologic changes with or without the agency of infection.

Acute inflammatory obstruction of the sub-mucous glands result in retention cysts or abscesses, and the chronic changes in these same glands producing small adenoma, single or multiple, project into the lumen of the canal and interfere by pressure with the discharge of the semen or with the passage of urine. The best example of the latter is seen in the glands of Albarran, a group situated directly underneath the mucosa of the neck of the bladder, which when enlarged, obstruct the vesical meatus

as effectually as hypertrophy of the prostatic glands themselves. Chronic inflammation results also in the narrowing, obstruction, and sometimes obliteration of one or perhaps both of the ejaculatory ducts.

Any of these pathologic changes may be the base of the chronic posterior urethral troubles for which patients vainly seek assistance and cure of the general surgeon who, unaware of their existence and without the proper clinical experience, fails to diagnose them and continues to pass steel sounds and wash out the bladder without effect, when what is required is the inspection and treatment of ulcers, or the destruction or removal of growths by the electric cautery, fulguration, snare or guillotine. Many an old man who has been operated upon for prostatic hypertrophy, either perineally or suprapubically, has an imperfect result, disclosed either as difficulty in expulsion, retention, or a disagreeable dribbling after urination, all by reason of failure of portions of the capsule to tie down in the process of healing, leaving tags or muscle flaps, or small adenoma projecting into the canal. These things can always be discovered by means of a urethroscope and cystoscope within a few weeks, and can always be destroyed or removed by the electric cautery, the fulgurating wire or the d'Arsonval spark with perfect safety and perfect functional results and without further cutting operations.

Urethral diagnostic instruments of Gordon or Marks and the MacGowan types in which air under pressure is the distending agent are very useful for the anterior urethra and where long straight tubes are used for minor operations in the posterior urethra.

In using the straight endoscopic tube in the posterior urethra great care is necessary in changing the angle of the instrument at the triangular ligament, and in passing the tube from the posterior portion of the bulb into the membranous urethra. With the MacGowan urethroscope, with the Kellogg, modified Geyke, or any other efficient pump attached, one can see the whole of the neck of the bladder, the trigone, the ureteral mouths, and the adjacent portions of the bladder wall and can make applications of chemicals, use the cautery anywhere in the field and treat the posterior urethra close up to the neck of the bladder without being annoyed by the urine.

These instruments are indispensable for the treatment of surgical troubles in the posterior urethra: (1) cautery points; these should be made of heavy iridoplatinum drawn in loops or shaped as knives or points; the shafts should be long and small enough to pass down the lumen of a No. 22 F. urethroscopic tube without obstructing the view of the operator; (2) a minute curette with a very long shaft, the handle of this instrument pistol-shaped and set almost at right angles with the shaft, is useful in curetting ulcers or dislodging calcareous masses, or for the removal of very fine papillary growths; (3) small silver crayon carriers or double head-ended probes of pure silver which should be



20 cm. long and of a diameter about No. 8 French for the application of pure nitrate of silver to the posterior urethra; (4) a follicular cannula which can be attached to an ordinary all-glass hypodermic syringe for the injection of an enlarged and infected prostatic duct or an infected utricle; (5) wooden applicators where minute crystals of chronic acid can be dissolved upon the moistened and diseased point touched; (6) Young's punch for the removal of irregularities and obstructions existing after prostatectomies; (7) high frequency current for papilloma, polypoid growths, undue enlargement of the colliculus and nodular irregularities, flaps or tags left after operations upon the prostate.

Having made a careful instrumental diagnosis by the optical instruments and being satisfied as to the confronting pathology, then comes the effort for its correction, always when possible by the non-mutilating and rather easily carried out methods; but when this will not do, the prostatic urethra and the prostate must be exposed by dissection through the perineum.

There is but one way to open a perineum for the purpose of conservative surgery upon the posterior urethra and that is the way which Proust of Paris and Hugh Young of Baltimore have developed.

In doing these operations, eye knives and eye scissors will be found most useful, and tonsil punches are very convenient.

THEO. DROZDOWITZ.

#### MISCELLANEOUS

**Rathbun, N. P.: The Genito-Urinary Clinic.**  
*N. Y. M. J.*, 1918, cvii, 771.

The author makes a strong plea in this article for a better co-ordination between the genito-urinary clinic and the hospital. The author realizes the importance of training in this branch of surgical work and feels that the surgical end has not received the recognition in hospitals that it should.

He divides men who are working in genito-urinary clinics into three classes:

1. Men who are starting in practice and want something to fill in time. It occasionally happens that some of these unpromising prospects develop an interest in the work and become an asset to the clinic. More often, however, they drift into some other interests.

2. Men who, while they have no intention of ever confining their work to urology, are sincere in their efforts to broaden the scope of their knowledge, and who wish to get on speaking terms with the fundamental principles involved in the diagnosis and treatment of genito-urinary diseases. Men of this type are an asset to any clinic.

3. Men, relatively few in number, who start out with the deliberate purpose of becoming urologists, and who are willing to massage prostates, pass sounds, examine smears, and to do other routine duties over a long period of time, meanwhile familiarizing themselves with the cystoscope as an instrument of diagnosis and treatment, feeling that in time they will become qualified and be given the opportunity to diagnose and treat a prostatic adenoma, or a tuberculous kidney.

The importance of following up cases is dwelt upon and the author feels that while end-results are not what they should be, nevertheless, he is of the firm conviction that many of the patients are carried beyond their period of infectiousness, so that while the clinics do not accomplish all that one desires them to, it is self-evident that this branch of the work is in better shape than it has been in the past.

Regarding his own clinic the author says, "There is one weak link in our chain, and this I have no doubt applies to many excellent genito-urinary clinics. Our relation to the hospital is not as close as could be desired. The Brooklyn Hospital has no definite organized and designated urological department. The chief of the clinic is attached to one of the general surgical services with the title of associate surgeon, and has assigned to him by the surgeon in charge two-thirds of all the urological work coming into the hospital wards. This practically consists of those cases coming in from the clinic. This arrangement is in a measure satisfactory to the clinic chief, although it has obvious disadvantages. However, it is manifestly unfair to the other men in the clinic who are entirely out of touch with the hospital end of the work, and are thus deprived of an important part of their training to which, in my opinion, they are justly entitled. We have reason to hope that this error, and I think it is one, will be corrected in the reasonably near future."

H. L. KRETSCHMER.

# SURGERY OF THE EYE AND EAR

## EYE

**Bates, W. H.:** *A Study of Images Reflected from the Cornea, Iris, Lens, and Sclera.* *N. Y. M. J.*, 1918, cvii, 916.

Bates gives the results of his studies in regard to reflected images from the eyeball and concludes therefrom that the old-time theory advanced by Descartes, supported by Young and later by Helmholtz, in which it was believed that the accommodative power of the eye is due to a change in the curvature of the lens, is wrong.

Much of the work of photographing images reflected upon the eyeball was done upon the eyes of fishes secured from the New York Aquarium. Clear images were secured not only from the front of the lens, but also from the iris, cornea, front of the sclera, and the side of the sclera, and these are shown in photograph.

It was noted that images reflected from the front and back of the lens showed no change in size during accommodation. Images reflected from the front of the sclera always showed changes when refraction was changed. Changes in images reflected from the side of the sclera upon effort to see at a distance were noted to be longer than in images obtained while the eye was at rest, indicating a flattening of the side of the sclera.

The images obtained upon effort to see near objects were smaller than any of the other images, indicating greater convexity of the side of the sclera, a condition one might expect when an eyeball is shortened, as in hypermetropia.

Images reflected from the cornea were obtained under varying conditions of refraction. Small images did not show this change. Large images showed changes similar to those obtained from the sclera. The ophthalmometer fails to show these changes. Bates states that these changes do occur but that they are so slight that the ophthalmometer, with its small images, fails to show them.

He summarizes as follows:

The accommodation of the eye is effected by an elongation of the eyeball.

The lens is not a factor in accommodation.

Myopia is produced by a strain to see distant objects.

Hypermetropia is produced by a strain to see near objects.

J. S. CLARK.

**Black, N. M.:** *The Eye in Industrial Accidents.* *Wisconsin M. J.*, 1918, xvi, 435.

Black reviews the causes, prevention and treatment of industrial accidents to the eyes, emphasizing the responsibility of the employee for utilizing the means furnished him by his employer for preventing

accidents. Legal requirements carried out by employers of labor are not sufficient to safeguard the eyes of employees unless the latter co-operate intelligently by making use of safety appliances, obeying printed instructions, and applying for treatment of injuries apparently trivial. The author insists upon cleanliness, avoidance of meddling interference by fellow workmen, and protection of the eyes from flying particles, heat, and excessive light.

EMORY HILL.

**Carreras, B.:** *A Case of Bilateral Congenital Blepharoptosis Successfully Operated upon by the Motais Method* (Un caso de blefaroptosis bilateral congénita operada con éxito por el procedimiento de Motais). *Siglo méd.*, Madrid, 1918, lxxv, 258.

The patient in this case was a woman twenty-eight years old who had congenital bilateral ptosis incomplete in the right and complete in the left eye. The author employed the Motais method, i. e., conjunctival T-incision with longitudinal division of the tendon of the superior rectus muscle, in one eye, but the results were not satisfactory. In the other eye he therefore carried out the Motais procedure as modified by Marquez in 1914 with complete satisfaction.

The author is of the opinion that the Motais operation is the most perfect and rational of those proposed for the treatment of ptosis of the upper lid and completely fulfils its indications in extreme ptosis in which the integrity of movements of elevation of the eye is preserved.

This operation can be done under local anæsthesia. The original technique as described by Motais is faulty; his final technique as perfected by Marquez is that which should be adopted. As far as can be deduced, it makes no difference whether the tendon half which is to supply the functional deficiency is internal or external.

The Motais operation permits the full preservation of the muscular equilibrium of the globe.

W. A. BRENNAN.

**Church, B. F.:** *Sarcoma of the Choroid; with Report of Two Cases.* *Calif. St. J. Med.*, 1918, xvi, 305.

The clinical symptoms of simple detachment of the retina and sarcoma of the choroid being almost the same during their early stages, a plea is made for more careful observation of all cases of retinal detachment. The globe is to be enucleated, if a neoplasm is present, at the earliest possible time. Acute pressure symptoms appear sooner or later in growths from the choroid, but not in simple detachment of the retina. Especial warning is



given against the performance of posterior sclerotomy, advocated by some for the removal of fluid in cases of simple serous detachment of the retina, until a positive diagnosis has been made. Pressure symptoms thus removed may delay the discovery of the real cause of the detachment.

In one case reported, the diagnosis of choroidal growth was made largely by acute glaucomatous symptoms present. The eye was immediately enucleated. A small melanosis was found springing from the choroid. There has been no return of the growth in four years.

The other case was not discovered until the growth had partly penetrated the sclera. One year has elapsed since the removal of the eye without local or metastatic extension of the disease. This will in all probability occur in time.

The early enucleation in the first case, a lapse now of more than four years, may mean an immunity from further trouble; that, however, is not positive, as recurrence of this character of growth has occurred after the lapse of seven years.

**Allport, F.: Some Remarks Concerning the Smith-Indian Intra-Ocular Operation for Cataract.** *N. Y. M. J.*, 1918, cvii, 924.

Allport questions the advisability of the average operator whose cases of cataract number perhaps fifty a year adopting this method of operation and abandoning former well tried methods.

Acknowledgment is made of the wonderful opportunities afforded at such clinics as the ones conducted by Smith and others in India. Allport states that the dexterity exhibited by Smith in this operation is greater than that of any other living man. It is stated that the patients in these clinics are tractable, patient, obedient, unpoisoned by stimulants and excessive rich food. Query is raised as to whether Smith could secure like results were he to operate in the United States where he would be confronted by a different class of people. These he states would be unmanageable, impatient, nervous, disobedient, opinionated people, accustomed to servility from others, whose bodies have grown fat, flabby and diseased by gluttony, drink, auto-intoxication, syphilis, etc., and in whom slow healing and considerable reaction may be expected.

Allport avers that it is mere child's play for Smith to do the intracapsular operation for the reason that this surgeon operates thousands of cases annually, but for the ordinary operator who would have fifty cataract cases in a year it would be a difficult and hazardous thing. He states that the advocates of this intracapsular operation claim that they obtain a clear pupil, absence of lenticular and capsular remnants, lack of iritis, and superior vision. This he recognizes as true in a few of the cases, but what of the unsuccessful cases, where collapsed and ruined eyeballs follow in the wake of ambitious but perhaps unwise operators?

The greatest good to the greatest number should be the motto of cataract operators. Allport be-

lieves some intracapsular operation may be and will be devised, suitable for average operators, but he does not award the Smith-Indian operation that distinction. He has noted further that those returning from a stay with Smith are more and more using the method in "selected cases." He reiterates that the operation is highly technical and demands of the operator a continuous and daily performance.

Allport advises holding fast to that operation which all are familiar with, perfecting this the while, then reaching out along more conservative lines for a future intracapsular operation, rather than doing an experimental difficult surgical procedure simply because Smith or a few of his followers are doing it.

J. S. CLARK.

**Calderin, A. M.: New Data Concerning the Formation of Cataract** (Nuevos datos y acaso una conjetura acerca de la formacion de la catarata). *Prog. de la Clin.*, Madrid, 1917, v, Supp., 202.

Calderin thinks that cataract is produced by an alteration in the permeability of the membranes of the cells of the lens capsule due to destruction of cholesterol. This alters the phenomena of osmosis and allows free passage to opacifying substances. This destruction of cholesterol is due to bacterial products in spontaneous cataract; to lack of cellular activity in senile cataract; to toxic products in cataracts depending on general pathological conditions not including traumatism. These are more than sufficient to explain the penetration of matters of the aqueous humor into the crystalline, effecting its opacity.

W. A. BRENNAN.

**James, R., and Trevor, R. S.: Cases of Hæmangioma of the Palpebral Conjunctiva Forming Pedunculated Tumors.** *Brit. J. Ophthalm.*, 1918, ii, 129.

Conjunctival hæmangiomas are usually met with on the globe but the authors have seen two arising from the posterior surface of the upper lid.

The two cases are reported, in both of which the tumors were the size of a pea, pedunculated, and easily removed.

The tumors described belong to the class of true blastomata and consist of large endothelial cells arranged in many layers around spaces or tubules containing blood, with an irregular layer of fibrous tissue around the periphery of the tumors. Reports of such cases are few and those found are mentioned.

S. S. HOWE.

**Wylar, J. S.: A New Canthoplasty for Trachomatous Conditions.** *Ohio St. M. J.*, 1918, xiv, 218.

This procedure finds its principal advantage in the old cicatricial stages of trachoma with pannus, blepharophimosis, and entropion where a removal of diseased conjunctiva is impractical. The idea is based upon the use of a small skin flap to cover the denuded canthal angle.

"After inserting a horn plate to protect the eyeball, the temporal side of the lids is put on a stretch

and the extent of the flap to be dissected is outlined with the point of a keratome. This tongue of skin starts about 2 mm. beyond the orbital edge and 2 mm. above the horizontal prolongation of the lid fissure, is carried nasally for half the distance to the outer angle, curves around and returns to a point 2 mm. below the horizontal exactly under the first incision. This small skin flap is now carefully dissected up in its entirety and laid back upon the temple. Inserting one blade of a straight scissors into the conjunctival sac, a horizontal canthotomy is made, reaching to the bony edge of the orbit.

A double armed suture is now inserted through the tip of the flap from the skin surface inward. The needles are then passed, one above, the other below the line of the canthotomy, horizontally entering under the palpebral conjunctiva in the extreme angle, passing over the bony edge under the skin of the temple and making their exit about a half inch from the rim of the orbit. When these two ends are finally tied over a small roll of gauze, the flap is pulled between the cut edges of the skin and lines the angle, readily assuming the crease made by the pressure of the lids, and preventing the denuded surfaces from adhering."

S. S. HOWE.

#### EAR

**Jones, I. H.: Value of Routine Examination of the Labyrinth.** *N. Y. St. J. Med.*, 1918, xviii, 167.

Before pointing out the various ways in which a routine examination of the labyrinth can be of service, the author corrects two misconceptions held by various otologists, misconceptions which have interfered with a universal adoption of these tests by the otological profession.

As to the first misconception, namely, that a study of the internal ear and its intracranial pathways is a neurological work, the author rightly insists that although the information may be of neurological value, it is elicited by ear tests and hence is an otologic study, to the same degree that an eye examination, although of value to the neurologist, is distinctly an ocular study.

As to the second misconception, namely, that such examinations are generally regarded as being extremely difficult, the author states that the entire physiology of these ear tests may be summed up in four sentences, as follows:

1. The eyes are always drawn in the direction of the endolymph movement.

2. The vertigo is always in a direction opposite to the endolymph movement; (a) past pointing is always in a direction opposite to the vertigo; (b) falling is always in a direction opposite to the vertigo. Stated differently, all the objective phenomena, the eye-pull (the slow component), the past pointing and the falling, occur in the direction of the endolymph movement.

As to the value to the otologist of these tests, the author mentions their helpfulness in the following points: (1) in the routine study of ear cases; (2) in determining the cause of vertigo; (3) in intracranial localization.

OTTO M. ROTT.

**Mahu, G.: Rapid Recovery from Mastoid Trepanations by the Carrel Method** (De la guérison rapide des trapanations mastoïennes par le méthode de Carrel). *Bull. Acad. de méd.*, Par., 1918, lxxxix, 309.

The application of the Carrel method in the treatment of mastoid trepanations according to the author adds to the security of the older methods a much more rapid progress. The method consists of not closing the wound immediately, irrigating it with Dakin's solution for a short time, then suturing when microscopical control of the wound indicates that this may be done. The treatment thus consists of three stages; operation, irrigation, and secondary suture. Details of each are given.

The observation of more than 20 adults and children during eighteen months in the authors otolaryngological clinic enables him to formulate the following results, which he has not obtained by any of the customary procedures:

1. Almost invisible scar.
2. Complete absence of pain during dressings.
3. Notable reduction in the duration of dressings: in simple mastoiditis the period during which dressing of the wound is necessary does not generally exceed ten days.
4. Guarantee of aseptic progress after suture, which is done under microscopic control, when confirmed by all the clinical symptoms.

The author thinks the Carrel method is not only applicable to mastoiditis, but to sinusitis and other affections of slow, painful, and difficult recovery.

W. A. BRENNAN.



# SURGERY OF THE NOSE, THROAT, AND MOUTH

## NOSE

**Bourget, J.:** Surgical Correction of Nasal Deformities Without Cicatrix (Nos corrections chirurgicales de nez disgracieux sans cicatrices). *Arch. brasil. de med.*, Rio de Janeiro, 1918, viii, 113.

It may sound paradoxical, the author says, to suggest the surgical treatment of nasal deformity without an eventual scar, and many may remain skeptical as regards the results. He works under local cocaine-adrenalin anæsthesia, doing an intranasal operation. The mucous membrane is incised in the places desired under guidance of mirror light. After incision the skin and osteocartilaginous tissues are separated; then the convexity or other deformity is corrected. Similarly in other types of deformities the necessary corrective operation is done endonasally. As the skin is not incised there is never any scar, and the patient is cured within seven to fifteen days.

W. A. BRENNAN.

**Bookwalter, C. F.:** The Intranasal Operation for the Relief of Chronic Dacryocystitis with Some Deductions from Twenty Cases. *Ann. Otol., Rhinol. & Laryngol.*, 1917, xxvi, 982.

This report is based on twenty cases operated upon according to the technique of West, prior to January 1, 1917.

All were relieved of suppuration at once and all with whom the author has been able to keep in touch have remained free. The author draws attention to the importance of having and maintaining a large opening into the nose and of having canaliculi in good condition. The openings in the nasal mucosa, bone and sac should be of the same size when the operation is completed.

During the following four to six weeks the patient should be kept under observation and the opening kept free from granulations. If at the end of this time the edges of the opening are firm and smooth, the case may be considered cured. OTTO M. ROTT.

## THROAT

**Richardson, C. W.:** Abscess of the Lung Following Operation on the Tonsils and Upper Air Tract. *Ann. Otol., Rhinol. & Laryngol.*, 1917, xxvi, 961.

In discussing this question, the author remarks that he has never seen an abscess of the lung following an operation upon the upper air tract in a child under fourteen years of age.

As etiological factors he considers the method of invasion to be either indirect, through the lymphatic or venous system from the wound surface, or direct through the inspiration of pus or bacteria-laden caseous material into the pulmonary tract.

Concerning treatment, the author mentions (a) medical or expectant treatment with a mortality of 60 per cent; (b) surgical treatment with a mortality of 30 per cent; and (c) artificial pneumothorax which if employed while the abscess is soft and compressible will result in cure. OTTO M. ROTT.

**Harmer, W. D.:** Warfare Injuries of the Larynx. *Lancet*, Lond., 1918, cxcix, 839.

The author's remarks are based upon data from 245 patients as follows:

Group 1, including 108 cases, particulars of which have been obtained partly by personal observation (24) and partly as the result of circulating a letter to 80 laryngologists in Great Britain and France.

Group 2, including 110 cases, the notes of which were obtained by examining the records of 1,873 patients suffering from gunshot wounds of the neck and treated in home hospitals during 1914 and 1915.

Group 3, including 23 postmortem specimens obtained from the Royal College of Surgeons of England; also 4 fatal cases, notes of which were supplied.

It has been noted:

1. That wounds of the larynx are infinitely rarer than injuries to the jaws.

2. That the entry wound may be situated in any part of the neck (jaw and chest occurrence is rare) and is generally smaller than the exit injury.

3. That the commonest place of entry is the anterior triangle of the neck, especially the region of the thyroid cartilage.

4. That transverse wounds (61) are more common than oblique (24).

5. That entry wounds in the middle line in front are very rare (8) and never occur posteriorly, doubtless because the spine is always involved with fatal results.

6. That the track of the missile may be horizontal, from above downward, or occasionally from below upward.

7. That the lower jaw may be struck first.

8. That injuries of the larynx between the level of the vocal cords and the cricoid are the most serious.

9. That tracheal wounds are rare (12).

10. That the pharynx or œsophagus is often included.

11. That extralaryngeal wounds are very common on account of the mobility of the air passages, the missile often passing obliquely by the side of the thyroid cartilage or transversely behind the larynx without penetrating into its cavity.

Concerning treatment, it is mentioned that high tracheotomy is less dangerous than low tracheotomy, and that special attention should be paid to providing free drainage, removing foreign bodies and

lacerated tissues, and suturing divided air and food passages. The question of warmth, moisture, inhalations, management of the tracheotomy tube, prevention of dyspnoea and the feeding are all highly important to recovery.

For the subsequent stenosis, dilatation by bougies, intubation tubes or upward-turning tracheotomy tubes should be gently practiced. Finally, the patient should wear a tube corked for months before it is permanently removed.

As regards after-results, in two-thirds of the gunshot injuries to the larynx that survive for more than a week, recovery is complete and no ill effects are produced beyond alteration in the voice. A small proportion of the cases with abduction paralysis (the most frequent type) recover, although total paralysis may supervene. Some of the survivors may be crippled by complications such as paralysis of the brachial plexus, bronchitis, loss of voice, and injury to health.

In closing, the author recommends as a prophylactic measure the insertion in the collar of the soldier's uniform of a band of steel which would have the same effect as a helmet.

OTTO M. ROTT.

**Botey, R.: The Treatment of Laryngeal Cancer by Radium Intubation** (Tratamiento del cancer larnigea por la intubacion radifera). *Rev. de. med. y. cirug. pract.*, Madrid, 1918, cxviii, 289.

Botey makes a preliminary report of a new method of treatment of laryngeal cancer by radium intubation.

In tracheotomized laryngeal cancers with stenosis, Botey introduces a tube containing from 3 to 5 cg. of pure radium. The tube is fixed in a cannula introduced through the mouth. The cannula is fenestrated and arrangement is made so that the radium emanations act through the fenestration where required according to the situation of the cancer.

If the cancer is unilateral Botey places a tube which contains a lead filter from 3 to 5 mm. thick which permits the action of the radium to be localized.

In epiglottic and arytenoid cancer with ample laryngeal permeability, Botey intubates without tracheotomy by means of an open tube which carries a radium-bearing tube in its head. If the cancer is localized in one cord or ring without stenosis, a tube is used which permits respiration through its lumen.

The time of application varies as the larynx easily becomes inflamed under intense and prolonged applications of radium; the actual time of application is limited to three, six, twelve, and eighteen hours, and the dosage varies from 9 to 80 cg. hours with 3 to 5 cg. of radium sulphate.

Although Botey has applied the method in many cases, some of which have been ameliorated and some with well localized cancer apparently cured, yet the time elapsed is too short to pronounce a definite cure and there may yet be recurrence. His

experience is that recurrences and metastases are more frequent with radium than in the case of a radical operation. Apart from surgery he thinks that radium intubation is the best means of treating laryngeal cancer.

W. A. BRENNAN.

## MOUTH

**Cole, P. P.: The Operative Treatment of Ununited Fractures of the Mandible.** *Proc. Roy. Soc. Med.*, 1918, xi, Sect. Odontol., 38.

According to Cole, the treatment of ununited fractures of the mandible may be designed to cure or palliate. Palliative treatment is afforded by the adaptation of a suitable prosthetic appliance. Cure can only be attained by direct surgical intervention.

In cases in which the non-union is associated with little or no loss of bone, he resorts to the following procedure:

The site of the fracture is exposed through an incision extending slightly into the neck with its convexity downward. The facial vessels invariably need division and ligature. The ends of the fragments are then exposed by cutting through the overlying soft tissues. The ends of the bone are freely bared by the use of a small sharp periosteal elevator. The fragments are freshened and trimmed and drilled for the passage of the wire. No. 18 gauge silver wire is used. Traction is made on the wire, which is twisted when firm contact has been determined. The wound is then closed, the question of drainage being decided by the amount of persistent oozing, which cannot be checked if much scar tissue is present. If a drainage tube is employed, it is removed in twenty-four hours.

He reports 9 cases treated in this way with but one failure. The failure was due to the fact that operation was undertaken before the latent sepsis had been eliminated. Infection with necrosis occurred and further operative measures will be necessary to determine union. He removes these wires after union has occurred because he considers them a source of weakness.

Two fractures involving the ascending ramus were plated, but the results were not satisfactory.

When the loss of tissue exceeds 3 cm., the use of a free bone transplant is indicated. In cases of non-union with considerable loss of tissue he uses a pedicled bone graft or a free bone transplant. He considers the pedicled bone graft the better because it possesses a blood supply sufficient to maintain its vitality.

The technique is as follows:

An open-bite splint is fitted and fixed before operation is undertaken. The incision in the skin extends low into the neck and is carried lower in front than behind. A flap is then turned up consisting of skin only, care being taken not to injure the underlying muscular fibers. Bleeding is arrested and the posterior fragment is then freely exposed. The posterior extremity only of the anterior frag-



ment is displayed in order that the size of the gap may be gauged.

An incision is made through the soft parts covering the outer aspect of the anterior fragment. This incision is parallel with the lower border of the jaw and lies immediately below the level of the buccal sulcus. Along this incision the basal portion of the jaw is sawn off to an extent sufficient to bridge the gap. When the bone is completely divided, the periosteum on its deep surface is incised. The bone fragment with its muscular pedicle is then gently freed from the underlying structures of the neck. This process is continued until the bone fragment can be easily adjusted in its new site without undue tension on its pedicle. The extremity of the posterior fragment is then trimmed to furnish as broad an area of contact as possible. Holes are drilled through the posterior and anterior fragments, through which fine silver wires are passed. These wires are made to perforate the pedicle close to its attachment to the bony fragment. They thus surround the graft and when tightened and twisted secure firm contact with freshened bone on each side of the gap. The deeper structures are united by a few catgut sutures. The wound is closed and drainage instituted for twenty-four hours.

This method is applicable to all cases where the gap does not exceed 3 cm. When the loss of tissue exceeds 3 cm., the use of a free bone transplant is indicated. The author claims that in all cases treatment from the beginning must be designed on the assumption that a future bone graft may be needed.

In using a free transplant, he makes an incision similar to the one just mentioned. The extremities of both fragments are freely exposed at the basal margin, trimmed and freshened to provide as broad an area as possible for contact with the graft. The graft is removed from the tibia. It is inserted and fixed with two screws. The soft

parts are closed with catgut and drainage tubes are inserted.

He reports 11 cases operated upon by this method. In one the operation was abandoned after exposing the fragments. Of the remaining 10, sufficient time has elapsed to estimate the results in 6. Four have been successful; 1 has been considerably improved; and 1 has been a complete failure.

A brief review of the operative results of all forms of non-union shows that 34 cases have been operated upon. In 2 cases operation was abandoned as impracticable. In 22 sufficient time has elapsed to give results. In 16 complete success resulted.

He urges the profession to endorse his conviction that this disabling condition can in the vast majority of cases be dealt with effectively by surgical means; and further, that surgeons have failed in their duty to patients, to themselves and to the profession if they omit to urge the employment of such means.

G. W. HOCHREIN.

**Frank, I.: Dentigerous Cysts; with Report of a Case.** *Ann. Otol., Rhinol. & Laryngol.*, 1917, xxvi, 991.

The author accepts New's classification: (1) simple cysts; and (2) adamantinomata.

The first or simple group consists of dental or root cysts and dentigerous cysts. The second group contains the enamel odontomata and the malignant multilocular cystic tumors.

After a brief discussion of the first group, the author cites a case of dentigerous cyst which entirely filled the antrum of Highmore. It was removed by making an incision on the buccal surface of the superior maxilla similar to that employed in performing the radical antrum operation. After exposing the mass it was incised, allowing the escape of fluid and revealing the location of the teeth which were firmly embedded in the alveolar process. The cyst was easily shelled out.

OTTO M. ROTT.

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# INTERNATIONAL ABSTRACT OF SURGERY

NOVEMBER, 1918

## ABSTRACTS OF CURRENT LITERATURE GENERAL SURGERY—SURGICAL TECHNIQUE

### ASEPTIC AND ANTISEPTIC SURGERY

**Gurd, F. B.:** A Contribution to the Technique of Infected Wound Closure, More Especially Compound Fractures. *Lancet*, Lond., 1918, xciv, 731.

Infected compound fractures, as seen in the home hospital, fall into three groups, depending upon degree and virulence of infection, resistance of the individual, and the length of time since injury.

1. Acute suppurative cellulitis with slough formation.

2. Open granulating wounds communicating freely with exposed bone and discharging purulent material in moderate quantities.

3. More or less quiescent bone inflammation communicating with the surface by means of one or more sinuses.

The treatment of acute suppurative cellulitis has consisted in excision and cleansing of the original wound. Adequate incision is made, tubes introduced, and discontinuous instillation with Dakin's solution or eusol employed according to Carrel's method. Dressings are changed daily or once in forty-eight or seventy-two hours, depending upon the amount of suppuration. So soon as necrotic fascia, muscle tissue, etc., have separated or have been excised and profuse suppuration controlled, the treatment is changed. The surface of the wound and surrounding skin is cleansed with soap and water and bathed with spirits. The wound is then dried, an excess of bismuth iodoform paste is placed over the surface and in all the pockets and bone cavities. Gauze gently wrung out of liquid paraffin and containing in its center a mass of "bipp" is placed everywhere in contact with the tissues.

Wounds so treated do not require dressing more often than once in five to fifteen days. Also wounds so treated have now been transferred into group 2.

As soon as the infectious process has become localized, as evidenced by absence of surrounding edema and hyperæmia, an effort is made to approxi-

mate the tissue and skin edges, and so minimize the ultimate formation of new tissue with its accompanying sequelæ of adherent scars and nutritional disturbances. This is done by the insertion of mattress sutures of heavy silk smeared with "bipp" and protected by small rubber tubes or buttons. These sutures are placed from 2 to 4 cm. from the edge of the wound and drawn sufficiently tight to put continuous traction on the tissues. At each dressing, at from six to twelve day intervals, new sutures are inserted and the tissues in this way gradually approximated. As the skin edges approach one another, the skin is undercut in order to avoid invagination of the scar. At each dressing the bone ends are carefully palpated and the "bipp" pack brought in accurate contact with bare bone. All loose white bone fragments are removed and the bone ends which are not covered with granulations within six weeks from the time of injury are nibbled away until healthy bone is encountered.

In the third class of cases, compound fractures in which the inflammation is limited to one or more discharging sinuses, the author suggests a more aggressive method of treatment than is commonly employed.

In the treatment of sinuses the author emphasizes the value of passive hyperæmia. As a working rule he believes it is correct to assume that any patient, in whom induction of passive hyperæmia in an infected limb for two periods of thirty minutes in one day is not followed by a febrile reaction of more than 99.4°, is a suitable subject for surgical interference. If no reaction follows the hyperæmia, operation may be undertaken at once. Only minimal interference should be carried out with a reaction of more than 99.4°.

Operation in this group consists of excision *en masse* of as much scar tissue as possible while still permitting the closure of wound edges. Free and fixed sequestra are sought for and removed, and dead bone is nibbled away. The wound is "bipped" and closed with mattress sutures.



In the author's series of cases, 8 were closed at first operation, 7 in two stages, and 7 in three stages. One case of attempted closure in two stages proved a failure.

The author reports 5 cases in detail which exemplify various details of the procedure.

In conclusion the author states that he believes a more aggressive and direct method of treatment of infected compound fractures than is commonly employed in the home hospitals is indicated. The techniques introduced by Morison and Carrel have each proved their usefulness in France.

The advantages claimed for the author's method are:

1. Lessening of discomfort and pain to the patient, as a result of increase of the interval between dressings and shortening of the open wound period.
2. Improvement of functional result in consequence of less frequent disturbance of bone fragments. A diminution in the number of painful scars, and early opportunity for secondary operations.
3. Early transformation of patients from dressing to observation class of men.
4. Shortening of hospital days per patient and consequent increase in the usefulness of hospital beds.
5. Economy of dressing material. V. C. HUNT.

**Austin, J. H., and Taylor, H. D.: Behavior of Hypochlorite and of Chloramine-T Solutions in Contact with Necrotic and Normal Tissues in Vivo.** *J. Exp. Med.*, 1918, xxvii, 627.

It has been known for some time that the chlorine content and consequently the potency of hypochlorite of soda solutions diminishes rapidly when in contact with the surface of wounds. This is emphasized by Carrel and Dehelly, and for this reason they advocate a frequent renewal of the antiseptic solution in the wound. This insures the keeping of the concentration as constant as possible.

It would be difficult to determine the rapidity of the fall in chlorine concentration on an actual wound as encountered in the ward, and almost impossible to parallel such observations with others on an equal quantity of solution in contact with an equal area of normal skin. Inasmuch as exact determinations of the rapidity of the fall in chlorine concentration on pathological and on normal skin under experimental conditions might be of value to surgeons using Dakin's hypochlorite and chloramine-T solutions clinically, the authors chose the following method of investigation.

The left ears of three white rabbits of the same relative size and weight were exposed to the rays emitted by a Coolidge tube. The sparkgap used measured three inches; the milliamperage was 10; the distance from the target to the ear was six inches; and the time of exposure was twenty minutes.

Eight weeks later the X-rayed ears each exhibited

a sharply demarcated gangrenous area over which there was considerable crusting of epithelium and secretions, and in the lumen there was much thick pus.

The ears of the affected rabbits were each suspended for twenty minutes in a beaker containing 400 ccm. of the solution to be tested.

As a result of these determinations the authors drew the following conclusions:

1. The fall in chlorine concentration of Dakin's hypochlorite solution is more rapid in contact with necrotic than in contact with normal tissue.
2. The fall in chlorine concentration of chloramine-T solution is very slight when applied to necrotic tissue and is negligible when applied to normal tissue.
3. The action of the hypochlorite solution on tissue results in the separation of particles of necrotic tissue, hair, epithelial scales, coagulated serum, etc., and a gradual digestion of these substances, taking place over a period of at least seventeen hours.
4. The fall in the chlorine concentration of the hypochlorite solution is not complete until the particles are completely dissolved.
5. Chloramine-T solution, 2 per cent, has no erosive effect comparable with that exhibited by the hypochlorite solution.
6. Repeated exposures to the three solutions show the hypochlorite solution to be superior in its cleansing ability on necrotic tissue.
7. The hypochlorite solution is much more irritating to normal rabbit skin than chloramine-T solution or the alkaline control solution.
8. Therefore the irritating effects must be due to the readily available chlorine.

GEORGE E. BEILBY.

**Thévenot and Tuffier, T.: Primary or Secondary Suture of the Soft Parts in 115 Fracture Wounds** (115 cas de suture primitive ou secondaire des parties molles chez des fracturés). *Bull. et mém. Soc. de chir. de Par.*, 1918, xlv, 1039.

Although at present the primary suture of wounds of the soft parts or articular wounds has become classical, yet this practice is only applied to a restricted number of fractures, in spite of the excellent results published. From August to October, 1917, the authors primarily or secondarily sutured a large number of important fracture wounds. Most of the cases were severe, many being extensive diaphyseal fractures. The evolution of these cases has been followed to February, 1918, in 115 cases, and the authors' report is based thereon.

The general results are shown in tables. The primary sutures done from August 1 to October 25, 1917, and followed until February 15, 1918, in 89 fractures of the limbs gave perfect reunion in 51 cases, partial or total disunion in 30 cases, and in 8 cases the results are unknown.

In 27 cases of secondary suture, there was perfect reunion in 17 cases, partial or no union in 4 cases,

and in 4 cases the results are unknown. No case in which there was any kind of defect is included in these reunions.

The treatment followed in these cases is: (1) radiography immediately on the man's arrival; (2) excision of soft contused parts, very extensive excision being avoided as far as possible, the authors preferring a little risk as regards the result of the suture rather than interference with ultimate function by too extensive removal of tissues; removal of bone fragments and curettage of the bony medulla; ether lavage; suture in layers. If the wound is deep and dirty or if the deep resection leaves a gaping cavity, the authors drain for two or three days. If the wound is observed to be extensively infected, it is left largely open and submitted to the Dakin or ether injections with Carrel tubes. Suture is done when laboratory tests show a satisfactory condition.

While it is the surgeon's duty to convert an open fracture into a closed one whenever he is sure of asepsis, there are many cases in which the decision between primary and secondary suture is doubtful. The authors do not consider that laboratory tests alone give sufficient indications. The surgeon must decide from his general impressions, guided by the clinical data. The nature of the projectile, the number and kind of foreign bodies extracted, the appearance of the soft parts, the time between injury and operation are factors to be taken into account. If these facts are not available, delayed suture is indicated. The nature of the fracture is also important. If it is comminutive with many loose fragments, it is better to await until secondary clearance is done, if it is called for, as the proper time to suture the soft parts.

When there is no active fighting, the authors have been able to do immediate suture in about 40 per cent of their cases. This figure is greatly reduced during periods of attack.

W. A. BRENNAN.

### ANÆSTHETICS

**Riethmuller, R. H.:** Causes of Failure and Un-  
toward Results in Conductive Anæsthesia.  
*Am. J. Surg.*, 1918, xxxii, 93.

Stock solutions of novocaine-suprarenin are objectionable, since their keeping property depends upon antiseptics of some kind or other which, when injected, act unfavorably upon the tissues and frequently produce after-pain or even sloughing. The admixture of a physiologic amount of sodium chloride or Ringer ingredients with novocaine-suprarenin is contra-indicated as the combination of NaCl and suprarenin is unstable, and such combination tablets invariably yield discolored solutions. Prolonged exposure to heat, light, and moisture results in decomposition of the tablets despite the precautions in packing exercised by the manufacturers. If hydrochloric acid is used to overcome the alkalinity of ordinary glass containers,

great caution is advised not to over-acidulate, since intense and prolonged after-pain will follow the injection of such solutions. The use of contaminated distilled water is condemned as it is conducive to after-pain, sloughing, and even suppuration.

The toxic symptoms produced by novocaine-suprarenin solutions have been shown to be due to the novocaine. Slow injection with just enough pressure to evacuate the syringe is the most efficient means for avoiding toxic symptoms. The precaution of advising the patient to eat a hearty meal before operation under local anæsthesia will practically eradicate all tendency to faintness.

The usual symptoms of toxic effects in the various types of patients are summed up as follows: Weakly anæmic patients are prone to pallor and slight trembling of the extremities. In cardiacs, distressing sensations in the heart region, shallow and rapid respiration, and perspiration on the forehead are noted. The bilious temperaments are most pronouncedly affected. In persons with high blood-pressure, the administration of mild narcotics previous to injection insures good results. In neurotics and hysterics, successful treatment depends on the operator's personality. Epileptics can be treated successfully during the period between the attacks. Children seem to be practically immune to both 1 and 2 per cent solutions.

Asepsis of instruments is necessary and the lack thereof is a common cause of after-pain and infections. The prime requisite for a successful technique of conductive anæsthesia is a thorough familiarity with the anatomy of the head. Any pain caused by the insertion of the needle is directly attributable to faulty technique. The mucosa and submucosa are rendered insensitive, at the same time sterilized, by the local application of the iodine-menthol-benzol mixture suggested by the author. For the rest, the needle should advance slowly through areolar, soft, fatty and connective tissues which have no sensory innervation.

E. B. FREILICH.

**Lapeyre, L.:** Anæsthesia by Combining Scopolamine with the Reclus Method (Anæsthésie par emploi de la scopolamine et de la méthode de Reclus). *Bull. et mém. Soc. de chir. de Par.*, 1918, xlv, 929.

Lapeyre combines the partial anæsthesia obtained by a prior injection of scopolamine with the local anæsthesia obtained by novocaine-adrenalin according to Reclus' technique. The novocaine is used only to obtain anæsthesia of the skin and superficial tissues; scopolamine renders the patient insensible to the other stages of the operation. Lapeyre has never observed any aggravation of the general state attributable to the scopolamine.

The technique employed is as follows: the injection of one-fourth of a centigram of morphine and one-fourth of a milligram of scopolamine one hour before operation; a second injection, the same as the first, half an hour before operation; rapid



surface anæsthesia at the time of operation. One-half of a milligram of scopolamine is generally sufficient and Lapeyre considers 1 milligram a dangerous dose.

Lapeyre has practiced this method for five years. In war surgery he finds its indications in the shocked or when there is kidney or liver intoxication. He uses it in civil surgery for gastro-enterostomy when the general state is poor, for entero-anastomosis or intestinal resections, strangulated hernia, operations on the bile-ducts, etc.

In 52 patients operated upon under particularly unfavorable circumstances, in only one case did scopolamine appear to add to the general depression or intoxication.

W. A. BRENNAN.

**Vignes, H.: Anæsthesia in War Surgery.** *Am. J. Surg.*, 1918, xxxii, 86.

The author had charge of handling 471 wounded soldiers brought direct from the battlefield after the lapse of from one and a half to four hours. General anæsthesia was used in 55 cases, local in 198, and 185 injections of morphine were given, usually ten minutes before operation. Except for simple, painless dressings, any other surgical procedure on the wounded in this war absolutely demands the use of general or local anæsthesia. Morphine was used as a preliminary to general anæsthesia to decrease the likelihood of excitement during induction, secure surgical narcosis more

readily, and maintain anæsthesia. It was used as a prophylactic measure against the incidence of apænia and to help diminish postoperative complications and dangers of intoxication and shock.

Local anæsthesia was used in excising contused tissues and removing debris; in cleansing the site of fractures, and in removing projectiles deeply imbedded in the thigh, loin, and region of the scapula. Contra-indications for local anæsthesia are: in vascular regions which bleed freely and others in which dissections are difficult; when important organs are involved, when tendons and aponeuroses cross the operative field, when it is difficult to see the lesion, or when a retractor is necessary. Cocaine, novocaine, and stovaine have given excellent results, but if it is anticipated that general anæsthesia must supplement the local, it is better to use stovaine or novocaine to avoid cocaine excitation during the induction of anæsthesia.

For prolonged and extended operations it is advisable to use quinine-urea hydrochloride on account of its control of after-pain. Ethyl chloride should be used for general anæsthesia whenever possible and presents the great advantage that the wounded operated upon shortly awaken to complete consciousness and can be more readily evacuated to the rear. The respective indications for chloroform and ether are the same as for civil practice.

E. B. FREILICH.

## SURGERY OF THE HEAD AND NECK

### HEAD

**Ceballos, A., and Bacigalupo, A. G.: Resection of the Auriculotemporal Nerve in the Treatment of Parotid Fistulæ** (La resección del nervio auriculo-temporal en el tratamiento de las fistulas parotideas). *Rev. Asoc. méd. argent.*, Buenos Aires, 1918, xxviii, 395.

The authors say that resection of the auriculotemporal nerve removes the secretory stimulus provided by this nerve owing to its connection with the gland.

A vertical incision of about 3 cm. is made immediately in front of the tragus and extending from the lobule of the ear to the superior border of the zygomatic arch. The nerve is isolated and sectioned as deeply as possible; this can be done without damaging the branches of the internal maxillary vein or other vessels and structures in the vicinity by observing care in the dissection. The intervention is so simple that it may be executed by any practitioner; it does not in any way alter the digestive properties of the saliva, as the loss of the secretion of one gland is supplied by hypersecretion of the other. This operation should be the method of choice, as it is simpler than any plastic operation on Stenson's duct, and its results are surer. The authors say that recently Morestin

in France obtained good results from it in cases of parotid fistulæ following war wounds. Clinical details are given of a case cured by this method of treatment.

W. A. BRENNAN.

**Thomas, G. F.: Report of a Case of Osteoma of the Frontal Sinuses.** *Am. J. Roentgenol.*, 1918, v, 341.

The author reports the case, first, because compact osteomata of the frontal sinuses are rare; and, secondly, because the condition recurred after its apparently complete removal.

The growth developed following an injury over the left eye. The first signs appeared within a month, there being ptosis of the upper lid, and swelling, with the eye pushed downward and outward. There was no pain or headache, but shortly afterward double vision developed. The plates made less than two months following the injury showed a very dense growth involving the left frontal sinus and extending into the orbit and above the frontal sinus, and beyond the median line into the right ethmoid region. The tumor was sharply demarcated from the normal bone structure by a thin bordering zone of absorption. The author suggested the absorption was due to the presence of the new-growth.

At the time of operation, the anterior plate of the frontal bone was found detached and showed signs of necrosis. Upon removal, an irregular ivory-like mass was found extending over the area as indicated by the plates. The mass was removed without disturbing the internal plate of the frontal bone, this being found intact.

Nine months later, two plates of the head showed the same type of growth, but this time much more extensive. At this time, the tumor was composed of two large masses, apparently arising from a common stalk. The plates a year following the original examination showed further increase in the size of the growth. A later history was not given.

W. A. EVANS.

**Rizzi, M. J.: Thrombophlebitis of the Lateral Sinus; Suppurative Thrombophlebitis of the Jugular; Cerebellar Abscess** (Tromboflebitis del seno lateral; trombo-peri-flebitis supurado de la yugular; absceso cerebeloso). *Semana méd.*, Buenos Aires, 1918, xxv, 33.

In a case observed by the author after a benign case of grippal otitis, a thrombophlebitis developed which evolved without fever. A trepanation of the antrum and right sinus region was done which did not check the suppurative thrombophlebitis and septicæmia. The jugular vein was manifestly the vessel involved, and a further operation was done to ligate this vein and remove the perijugular ganglia. Fifty-five days after operation for thrombophlebitis of the sinus it was necessary to open a cerebellar abscess of the right lobe. Various trepanations and encephalic punctures gave negative results and an occipital craniectomy was done. This was followed by a suppurative cerebellitis which slowly cleared up and the patient made a good recovery. Eight months after the last intervention the patient is in good condition and has resumed his normal occupation. W. A. BRENNAN.

**Lobingier, A. S.: Cerebral Oedema in Intracranial Trauma.** *Calif. St. J. Med.*, 1918, xvi, 303.

The importance of oedema in injuries to the brain has received a tardy recognition partly because of the overshadowing significance hitherto attached to hæmorrhage. Oedema in a greater or less degree is dependent on the severity of the injury sustained. Horsley in 1886 demonstrated clinically that oedematous changes in the fundus could be relieved by trephining the skull, and at the International Congress in Berlin in 1890 showed that the papilloedema associated with brain tumor was an evidence of intracranial tension which could be relieved by a decompressive operation on the skull and dura. He also demonstrated with photographic precision that the first invasion of the disc was a dilatation of the retinal veins on the upper nasal side, which passes gradually downward and across to the temporal side. Following this is the blurring of the oedema which takes the same course and,

where the intracranial tension persists, becomes diffuse over the disc, developing a true papilloedema.

If, as Horsley found, the macrocytes and connective tissue corpuscles lying beneath the muellerian fibers of the papilla compose the histology of papilloedema, it is obvious that one should find in the cytotic changes in the dendrons of the brain proper analogous phenomena as a result of trauma. It is quite apparent that one must look farther than the changes in the vascular mechanism of the brain for an explanation of oedema.

Sargent and Holmes studied 1,239 patients in the London hospitals and found that while the degree of disability was to a degree dependent upon the severity of the trauma, most of the paralysis and the sensory and visual disturbances noted in the earlier stages were due not so much to the result of destruction of brain tissue as to concussion, oedema, and vascular disturbances that extend beyond the site of the primary injury. While from the degree of the trauma an estimate can be made of the severity of the injury, yet it is not always the true index to the intracranial tension.

A patient in shock with rapid pulse should be placed in bed with an ice cap to his head. Quiet should be preserved, but no opiates given if possible. Blood-pressure and pulse-rate should be taken. As the intracranial pressure increases, the blood-pressure rises and the pulse-rate decreases. When the pulse falls below 60 in an adult and 80 in a child, the optic disc should be examined every few hours. An unerring evidence of increased intracranial tension is an increasing oedema of the disc. Confirmation of this may be had in a measurement of the pressure by the manometer as determined at lumbar puncture. When the pressure rises above 10 mm. it is a plus tension. When 20 ccm. of spinal fluid is withdrawn, the manometer will show a drop in intracranial tension, but the effusion and oedema will persist and the fundus remain but slightly changed.

The treatment of cerebral oedema will always consist in the safe and definite relief of intracranial tension. Operation should never be done when the pulse is increasing in frequency, but should be performed before the oedema has passed the tentorium to centers in the medulla. While the pressure may be somewhat relieved by lumbar puncture, yet there is always danger of withdrawing an excessive amount of fluid and causing the medulla to collapse into the foramen magnum. A subtemporal decompression suggested by Horsley and perfected by Cushing offers dependable relief but it seldom returns a patient more than 75 or 80 per cent of his former mental and nervous competency.

P. W. SWEET.

**Pfingst, A. O.: Brain Abscess; Its Causes and Pathology.** *Mississippi Valley M. J.*, 1918, xxv, 193.

The mode of entrance of the infecting organism is discussed and a list of the various types of organ-



isms which have been found in brain abscesses is given. The frequency with which each cause is responsible for abscess is considered. Traumatic origin gives abscess mostly in the frontal and parietal lobes; middle ear infections in the temporo-sphenoidal lobe and cerebellum; and pyæmia more often in the occipital lobe. The gross pathology of the various types is given. Cerebral abscess is more frequent than cerebellar abscess in the ratio of four to one.

CARL R. STEINKE.

**Dandy, W. E.: Ventriculography Following the Injection of Air into the Cerebral Ventricles.** *Ann. Surg.*, Phila., 1918, lxxviii, 5.

In order to get a skiagram of the cerebral ventricles it is necessary to remove cerebrospinal fluid and substitute air. Owing to free communications between the third and lateral ventricles, fluid and air pass readily from one to the other, the fluid gravitating to the dependent portions and the air staying above. Most fluid can be obtained from puncture in the anterior part of either lateral ventricle, with the head placed face down. The exchange of air for cerebrospinal fluid must be made accurately; the air injected must not be greater in volume than the fluid withdrawn.

A two-way record syringe is used. Twenty ccm. of fluid is withdrawn and an equal amount of air injected. This is repeated until no more fluid can be aspirated. By taking a series of plates in different planes with the head in various positions, allowing the air to distend first one ventricle and then the other, a greater area can be visualized.

The author has injected 20 cases, all children, without ill effect, except in one case where pressure symptoms developed. Ventricular puncture with release of air gave quick relief.

Internal hydrocephalus can be positively diagnosed by ventriculography. It is hoped that in many cases it may make possible the early diagnosis of tumor.

LISTER TUHOLSKE.

## NECK

**Aikins, W. H. B.: Radium Therapy in Hyperthyroidism, with Observations on the Endocrinous System.** *Internat. J. Surg.*, 1918, xxxi, 217.

The author has had 45 cases of hyperthyroidism under treatment by radium. Of these, 23 have been clinically cured; in 17 there has been an improvement, and 4 cases have passed from observation. In only 19 patients did the thyroid gland itself decrease in size. General medical measures were applied as well in the treatment. Several other authors are quoted who have likewise reported favorable results with radium treatment.

The occurrence of exophthalmic goiter following the removal of the ovaries in two of the three cases under observation interested the author in the inter-relationship existing among the organs of internal secretion, and he cites these cases in detail. He makes brief mention of the development of knowledge of the internal secretions and hormones and cites the clinical and experimental information obtained by numerous investigators tending to confirm the inter-relationship between the secretions from the endocrinous system. Thus the greater frequency of goiter in women, the marked thyroid gland changes accompanying periods of great sexual activity such as puberty, pregnancy and the menopause, all tend to confirm such an inter-relationship. The removal or atrophy of the thyroid has a marked influence on the genital system; and inversely, double oophorectomy leads to profound alterations in the thyroid and other endocrinous glands. Calcium metabolism is also supposed to have a bearing and to be dependent upon this inter-relationship.

In conclusion the author states that there is unmistakably an intimate and marked relationship between all the organs of internal secretion and that they one and all play an important part in the process of development and reproduction.

ADOLPH HARTUNG.

## SURGERY OF THE CHEST

### CHEST WALL AND BREAST

**Durham, R.: War Surgery of the Chest.** *Internat. J. Surg.*, 1918, xxxi, 224.

Certain general surgical principles applicable to war wounds of the chest are brought out by the experience in the great war. In the period of lowered resistance with contamination present, i.e., the first four hours after injury, clean-cut surgery with the removal of destroyed tissues, foreign bodies, or particles of clothing, and gentle handling are in order. Then "physiologic rest" (Crile), the minimum of transportation and discomfort, infrequent dressings, and the use of the modern antiseptics aid normal tissue resistance. Dakin's solution, "bipp," eusol, flavine, and dichloramine-T are of great aid.

In the presence of infection, incision and drainage or the use of the Dakin treatment are resorted to, together with rest, moist heat, and the elevation of the affected part. After four or five days the stage of healing and granulation occurs, at which time secondary closure may prove successful. Finally sinuses, bone defects, nerve injuries, etc., require the attention of the surgeon.

Trench warfare results in great numbers of chest wounds, which demand the most skillful modern methods of treatment. High velocity bullets often cause very slight damage. Larger wounds result in hæmorrhage, secondary infection, lung collapse, lung abscess, etc. Radical surgery is applicable to these conditions: contused and contaminated tissue is excised; missiles and clothing fragments are

removed; the chest opening is enlarged, when necessary, under local anæsthetic, and the injured lung tissue removed, the lung sutured, and tears of the diaphragm closed, after the removal of all clots. Dakin's solution or "bipp" is freely used, and the chest wound closed where possible. Roberts reports 200 chest wounds, 108 of which healed without infection after primary closure of the pleural cavity.

Shrapnel and bullet entrance and exit wounds, and those due to small fragments of high explosive missiles, do well under expectant treatment, or if operated upon in the presence of increasing dyspnoea, or cardiac displacement. Severe wounds with lung or bone injury, or shell and clothing fragments in the pleural cavity, and open "sucking" wounds, have a high primary mortality, and a later operative mortality of 7 to 25 per cent.

After-treatment consists of rest, heat, opiates, coffee and saline by rectum, and stimulants. Hæmothorax with dyspnoea is treated by aspiration and oxygen replacement. Sterile hæmothorax of moderate size absorbs without operation.

Retention of foreign bodies in aseptic cases does not appear to permanently cripple for military service.

Drained infected hæmothorax cases show a return to duty of fifty per cent.

Late mortality from chest wounds is nil in England, but high in the fighting zone, and up to fifty per cent in the presence of infection.

Early radical surgery with the new prophylactic methods of cleansing operation, together with the use of the modern war antiseptics, are to be recommended.

**Dobson, J. F.:** A Lecture on Some Features of Gunshot Wounds of the Chest. *Brit. M. J.*, 1918, i, 661.

A great change has recently taken place in the treatment of chest wounds. They are now treated on the same principles as are gunshot wounds of other parts of the body. The only cases in which operation is not advised are those in which wounds of the chest wall are small and clean, where there is no evidence of fractured rib, and where the retained foreign body is small.

The results of early operative treatment are a striking triumph for British surgery. But there are failures or only partial successes following operation and it is to these cases this paper has reference.

The chief cause of failure is sepsis. The proportion of secondary sepsis following immediate closure of the chest after thoracotomy varies from 20 to 40 per cent. Gask and Wilkinson reported 67 thoracotomies followed by empyema in 22 cases (32 per cent) and death in 19 cases (28 per cent). In 15 of these cases the operation was performed for infected hæmothorax, and in 12 cases or 80 per cent an empyema later developed with 33 per cent resulting in death.

Anderson found secondary drainage necessary in

12 (20 per cent), and there were 14 deaths. Roberts and Craig in 25 thoracotomies had 40 per cent of deaths. Lockwood and Nixon had 82 thoracic and abdominothoracic cases, of which 29 per cent died. Duval gives details of 29 thoracotomies with 8 deaths (29 per cent) followed by empyema in 9 cases with 2 deaths. In all these cases the late mortality and empyema rates do not appear to be included. It can safely be said that the mortality and morbidity among chest cases evacuated from the casualty clearing station is still considerable and almost entirely due to sepsis.

The best prevention of sepsis is early and thorough operative treatment with complete closure. Gray, contrasting the results of immediate closure and drainage, gives the following figures: 198 cases in which the pleural cavity was drained gave a 50 per cent mortality and 57 cases of closure gave 29.8 per cent mortality. He states that operation with closure is therefore 20 per cent better than with drainage. This probably is not literally true, as the most heavily infected and serious cases would be drained.

According to Bradford and Elliot infected hæmothorax occurs in 25 per cent. The infection may be early or late in the second or third week. The usual symptoms are dyspnoea and increased temperature and pulse. The cases of the most urgent rapid onset of symptoms are those of gas bacillus infection. Late cases are extremely dangerous.

Preliminary aspiration may be resorted to but the symptoms are only in part due to mechanical pressure. Drainage of the chest should be effected as soon as possible, consisting of either a minor thoracotomy under local anæsthesia or a wide incision with rib-spreading exposure and removal of fluid clots, foreign bodies, etc. Complete closure is possible only in the early cases, drainage being often necessary. But the patient may still succumb to sepsis. The drainage should therefore be supplemented by instillation of an antiseptic. This may be done by irrigation through a drainage tube, by Carrel's technique, by filling the cavity with Dakin's solution every four hours, the fluid being siphoned off after two hours, or by the author's special silver cannula with which he has had some strikingly good results.

Chronic empyema is not infrequently the result of an infected hæmothorax. In comparatively early cases where the adhesions tethering the lung are not very dense, they may after a time allow sufficient expansion of the lung to effect obliteration of the cavity. If this does not take place, chronic empyema results. This may be local, associated with very little, partial, or with a complete collapse of the lung. The available operations are the Estlander, Schede, Delorme, osteoplastic resection with muscle flap, and by separating adhesions which bind the lung to the chest wall, the last mentioned of which the author favors in suitable cases.

If an operation is performed for infected hæmo-



thorax or empyema, the foreign body whenever accessible should be removed if the patient's condition will permit it.

C. A. HEDBLÖM.

**Meakins, J., and Walker, T. W.: The After-Effects of Wounds of the Chest and Their Treatment.**  
*Bull. Canad. Army M. Corps*, 1918, 1, 40.

Meakins reports his observations on the after-effects of injury to the chest and the best means of reducing the disability in a series of 70 cases admitted to the hospital during the last six months of 1917. The majority had been under treatment for an average period of four weeks. Eleven, or 15.7 per cent, had been operated upon for evacuation of pus in the pleura. In 66 per cent there was a history of fluid in the pleural cavity.

Examination revealed thickened pleura in 38.6 per cent, fluid in 12.8 per cent, fluid and thickened pleura in 12.8 per cent, air in 4.3 per cent, and collapsed lung in 2.9 per cent. In all cases operated upon for empyema, a sinus persisted. Empyema developed in three cases after they had come under observation.

Little or no information of value as to the patient's condition to perform work could be gained from percussion and auscultation. The most significant finding was the development of distinct physical deformity, muscular atrophy, dropping of the shoulder girdle, contraction of the chest wall, or curvature of the spine. Special apparatus was devised for measuring and recording such deformity.

It was found that lesions of the pleural cavity were the most important in the production of deformities. Of 25 hæmothorax cases in which all signs had disappeared three weeks following injury, there was no case of deformity. In 8 in which signs of fluid in the pleura persisted to the time of admission, 7 already had pronounced deformity. Of 7 empyema cases operated upon within fifteen days of the time of injury, none showed deformity. Of 8 empyema cases not operated upon until six weeks after injury, all showed conspicuous deformity. Early evacuation of fluid is therefore of great importance in the prevention of deformity. Cases with simple perforation of the chest without pleural involvement showed only local atrophy of muscles in a greater or less degree.

The deformity due to pleural involvement is due partly to the immobilization of the affected side and reduction in volume of intrathoracic contents. This is indicated first by elevation of the dome of the diaphragm, changes in the bony structures; then follow diminution of intercostal spaces, dropping of the shoulder, and after a certain point, scoliosis. Apparent deformity occurred more frequently and to a greater degree on the right side, evidently due to less mobility of the diaphragm on this side.

The treatment was based on the principle that prevention would be more fruitful of results than correction after deformity had developed. Two points were considered of prime importance, first, the prevention and correction of muscular atrophy;

and second, the increase of power of expansion of the affected lung. To this end a series of exercises were prescribed designed to exercise the muscles involved and to permit expansion of the affected lung, the other side being partly immobilized. The sooner the exercises were started, the better.

The result of the use of these exercises was very satisfactory. In cases of atrophy of the muscles, redevelopment was rapid and complete. Bony deformity was arrested and in some cases diminished.

Out of 58 cases discharged from the hospital, 52 were considered fit for some form of duty and the great majority eventually for full duty. Only 6 were discharged from the army. The conclusion is drawn that injury to the chest is not necessarily a conspicuous factor in invaliding soldiers from the army.

C. A. HEDBLÖM.

**Tagliavacche, N.: Polycystic Disease of the Mammary Glands, or Reclus' Disease** (Sobre la enfermedad poliquística de las glandulas mamarias 6 enfermedad de Reclus). *Rev. Asoc. méd. argent.*, Buenos Aires, 1918, xxviii, 484.

Tagliavacche describes a case of polycystic disease of both breasts in a woman of forty-one for which he did a double amputation and removed the axillary ganglia which were inflamed. Histologic examination showed that the tumors in some points presented the appearance of pericanalicular fibromata, and in others of papilliferous cysts. There was no sign of malignancy.

Bilateralism although frequent does not appear to be important as a pathognomonic symptom. The affection even if slight may be accompanied by radiating pains. The differential diagnosis considers tubercular mastitis, dendritic epithelioma, and polycystic cancer.

The frequent co-existence of Reclus' disease with cancer and the diagnostic difficulties in such cases always impose a careful histologic study of the extirpated lesions, especially when a simple amputation alone is done. It is probable that inflammatory tuberculosis plays a part in many cases and accounts for the chronic inflammatory character of the disease. Malignant transformation is frequent, and the treatment ought to be radical.

W. A. BRENNAN.

**Meyer, W.: The Advisability of Totally Excising Both Pectoral Muscles in the Radical Operation for Cancer of the Breast.** *Ann. Surg.*, Phila., 1918, lxxviii, 17.

Meyer has advocated the total extirpation of both pectoral muscles in operating for breast carcinoma because between the two muscles there exist lymphatic vessels which communicate below the clavicle with deeper lymphatics. These interpectoral lymphatics have repeatedly been shown to contain cancer cells; consequently any operation which does not remove these lymphatics *en masse* tends to spread the cancer cells.

The chief objection to the removal of these



muscles is made by those considering this step unnecessarily mutilating. As the nerve supply of the clavicular portion of the pectoralis major comes from the sternal portion, sparing the clavicular portion is of no functional benefit. The principle of removing all cancer-infected tissue *en masse* cannot be adhered to in breast carcinoma without total excision of both pectoral muscles.

LISTER TUHOLSKE.

**Boggs, R. H.: Post-Roentgen Treatment of Carcinoma of the Breast.** *Am. J. Roentgenol.*, 1918, v, 301.

The author emphasizes the necessity of the roentgenologist's knowledge of the lymphatic system in order to make exposures intelligently, as well as the importance of a technique which will permit of the deep tissues receiving the full physiologic dose. The author urges the advisability of treating not only the line of incision, the axillary and supraclavicular regions, but also points out the necessity for treating the suprascapular, paravertebral, supraxiphoid, lateral intercostal and inguinal group.

In addition, he points out the necessity for exposing the hepatic region, for by autopsy it is known that the liver is more frequently involved in a secondary process than any other of the internal organs, the hepatic involvement being frequently very early. The frequency of involvement of the pelvic viscera secondarily from a mammary growth is given, but nothing is said as to the treatment of the pelvic organs in the discussion of the technique for the various regions.

In commenting on the varying frequency of metastases in the young and the old, the author points out that the low rate of metastases in the aged is due to the fact that the lymphatics are atrophied, and he points out that the roentgen ray is effective no doubt through the atrophying action of the rays.

Ante-operative roentgen therapy is discussed and its advantages pointed out.

The author gives in detail his method of exposing the different areas, but this does not vary from the usual cross-fire method of treatment.

W. A. EVANS.

**Gray, H. M. W.: Surgical Treatment of Penetrating Wounds of the Thorax.** *N. Y. M. J.*, 1918, cviii, 1078.

The term penetrating is used to indicate actual injury of the pleura or mediastinal areas of the chest. Penetrating chest cases arrived at casualty clearing stations during a recent battle in the proportion of 1 to 40 wounded men. Chest wounds divide themselves from the clinician's point of view into four classes: cases which do not require operation, cases which demand operation at the earliest possible moment, an intermediate class in which the size of the wound or the severity of the symptoms makes decision as to immediate treatment very difficult, and moribund cases.

The majority of penetrating chests arrive at the casualty clearing station in an exhausted and frequently alarming condition. They should be rapidly examined, and put to bed warmed and stimulated. If excited or anxious, a sedative should be given. If an open, sucking wound is present, it should be made air-tight by suture or gauze plug.

Severe respiratory distress may persist owing to the amount of hæmothorax or hæmopericardium. Persistent severe pain is likely due to irritation of the pleura or pericardium by a rough foreign body or a fragment of rib. Pericardial pain may be referred to the shoulder or side of the chest. The diaphragm is fairly frequently injured and irritated by such foreign bodies projecting into it and the dyspnoea is then intense. These conditions demand immediate operation. Moribund cases which arrive at the casualty clearing station die chiefly from the effect of hæmorrhage and shock.

No case can be pronounced free from the danger of sepsis. The earlier it develops, the more serious it is likely to be. Liability to early and fulminating sepsis depends chiefly on the size of the wound. Sepsis has been the cause of early death in most of the sucking wounds which reach the casualty clearing station.

Most cases of closed hæmothorax with punctate entrance and exit bullet wounds and wounds caused by lodging shrapnel balls or shells, if they survive until they reach the casualty clearing station, usually recover from their initial symptoms fairly quickly. There may be little or no hæmothorax. If it does not reach higher than the nipple line, shows no sign of increasing, and if there is no evidence of infection, such cases may be sent to the base in from three to six days. If the fever, rapid pulse and respiration persist, the fluid must be aspirated and cultured. A crimson purple color and foul odor are proof of anaerobic infection. The withdrawal of foul smelling gas is conclusive evidence. Negative tests are not conclusive. Sepsis may develop in islands. If symptoms pointing to infection are sufficiently prominent, operation should be done without waiting for bacteriological confirmation.

If the hæmothorax is a larger one, aspiration may be required any time during the first three days to relieve distressed respiration. The fluid should be withdrawn slowly and only a sufficient amount to make the patient comfortable. Aspiration of a larger quantity during this period may restart hæmorrhage. If urgent symptoms develop again, it is probably best to make a large opening in the chest wall, clear out the pleural cavity, control the source of hæmorrhage and close the opening completely. After the critical three days in other cases the bulk of the fluid may be withdrawn preferably with replacement by air or oxygen.

Severe open wounds comprise 25 to 30 per cent. These cases demand operation at the earliest possible moment to tide the patient over the acutely dangerous period brought on by hæmorrhage, collapse of the lung, displacement of the lung, and to pre-



vent sepsis. Thorough excision of the lacerated tissues and removal of blood-clot and foreign bodies are essential to prevent sepsis.

On account of danger of inflammation in the contralateral lung, nitrous oxide gas and oxygen is the best where a general anæsthetic is necessary.

Easy access and low drainage are important. The original wound is excised *en masse* if possible. If this wound does not give suitable access to the pleural cavity, it is stitched up layer by layer. If pleura has been destroyed, muscle is used to cover the gap. If muscle is also gone, a sliding flap is used. A fresh incision is then made with rib resection for better access. The lung is dealt with as necessary. Foreign bodies are removed, the track in the lung is cleaned out, bleeding points ligated, sutured, cauterized, or controlled by a gauze plug. Gangrenous or very badly lacerated lung is excised. The pleural cavity is then wiped dry and well controlled; the air should now be aspirated.

If the diaphragm has been lacerated it should be repaired as the first step of the intrapleural operation. Injuries of the abdominal viscera may be best exposed by resecting a rib or ribs, splitting the diaphragm parallel to its fibers and then prolonging the incision downward as far as necessary.

Physical signs may be misleading as to whether fluid is accumulating in the pleural cavity following operation. Routine aspirations should therefore be made within twenty-four hours after operation and at least every second day thereafter. V. C. HUNT.

**Petit de la Villeon, E.: The Extraction of Projectiles from the Pleura and Diaphragm** (Projectiles pleuraux, projectiles diaphragmatiques; leur extraction opératoire). *Presse méd.*, Par., 1918, xxvi, 302.

The author has extracted 48 pleural and 16 diaphragmatic projectiles. His earlier operations on the pleura were always thoracotomies, making a large opening combined with costal resection; but this method was soon abandoned for extraction by forceps under the guidance of the radioscopic screen, making a small button-hole incision only. This method has constantly given him the best results with the least amount of operative traumatism and a simple postoperative course; and he is quite satisfied that for pleural projectiles it ought to supplant thoracotomy, as he thinks the operative traumatism of the thoracic wall as well as the creation of a pneumothorax are unnecessary and should be avoided. The only exception he makes is in the case of projectiles situated in the mediastinal pleura. Here a wide thoracotomy is necessary, and the methods of Fontan, Le Fort or Duval are recommended.

There is one point of technique in the extraction of projectiles by forceps under screen control to which the author calls special attention, namely, the necessity of never approaching the projectile by a direct vertical trajectory, but always by an extremely oblique one. The button-hole incision

through which the forceps passes must be very far from the indicated position of the projectile. In the pleural region this will generally not be very inconvenient. Moreover, in his earlier practice, in extracting a projectile in the posterior pleura the author found it necessary to deliberately make a transpulmonary insertion of the forceps. Although the harm done was slight, he now thinks it quite unnecessary to traumatize the lung and by compressing it in a selected trajectory he avoids it.

With regard to projectiles in the diaphragm, Petit de la Villeon distinguishes those situated in the right diaphragm, those in the left, and those in the mediastinal diaphragm.

For projectiles in the right half of the diaphragm a high thoracic route of approach is preferred; and for these the extraction by a button-hole incision under guidance of the screen is the most desirable method.

Conditions however are quite different in the case of the left diaphragm on account of its relations with the abdominal organs covered by it. Extraction in this region under screen control is dangerous because it may lead to the opening of the large tuberosity of the stomach or the left angle of the colon, which adhesions caused by the projectile may have fixed to the diaphragm in this region. A laparotomy by the low abdominal route is to be preferred.

The author believes that extraction under screen control is contra-indicated in the case of projectiles situated in the mediastinal diaphragm. Here also open operation by the low abdominal route is preferable. For projectiles in the posterior part of the middle diaphragm a high supra-umbilical laparotomy, median or oblique, is best when extraction is necessary; but the author does not think that all projectiles here should be extracted because many are well tolerated. The author calls attention to the great necessity for highly skilled radioscopy in locating projectiles and following them when extraction is made under the screen.

W. A. BRENNAN.

## TRACHEA AND LUNGS

**Rossi, A.: Traumatic Slow Pneumonitis and Pulmonary Tuberculosis** (Pneumonite lenta e tubercolosi polmonare traumatica). *Riforma med.*, Napoli, 1918, xxxiv, 188.

Th: present war has demonstrated that the lung may be penetrated by a projectile without grave immediate consequences; but very often when such wounded are examined after a time a certain number of changes will be found in the pleura and lung. The author gives the details of three such cases, accompanied by radiographs.

Some cases described in literature and those reported make it evident that slow pneumonic infection with a tubercular tendency is possible among the end-results and complications arising from thoracic gunshot wounds. The trauma in such

cases is of the first importance, especially when a radiologic examination shows that infection is manifested not only on the injured side but in the vicinity of the projectile or along its trajectory into the lung.

The diagnosis of such traumatic infections is also of great value in pensioning the wounded soldier.

In war surgery one must consider the importance of permitting a projectile to remain, considering the possibility of a traumatic tuberculosis becoming manifest in the vicinity of such a projectile.

The cases reported also show the necessity for a complete radiologic examination of those who show late complications from chest wounds or who badly tolerate a projectile left in the thoracic cavity.

W. A. BRENNAN.

**Avoni, A., and Caliceti, P.: Experimental Research on Modifications in the Lung Caused by Ligation of the Pulmonary Vessels** (*Le modificazioni del polmone nell'allacciatura dei vasi pulmonari; ricerche sperimentali*). *Poliedin.*, Roma, 1918, xxv, sez. chir., 207.

The authors review recent experimental work upon the effects of ligation of the thoracic vessels since Bruns and Sauerbruch demonstrated in 1911 that single branches of the pulmonary artery could be ligated without grave danger. Generally the results are incomplete as regards the alterations in the lung; few researches have been made regarding the alterations produced in the pulmonary parenchyma by modifying the venous circulation.

In the Institute of Special Surgical Pathology of the University of Bologna, the authors have undertaken a series of animal experiments under the most careful asepsis, opening the left pleural cavity by section in the fourth intercostal space, ligating the desired vessel, and then closing the wound. They found that rabbits in which the venous branches were ligated lived, but that those in which arterial branches were ligated, died within a short time.

On the veins two series of experiments were made: ligation of a branch of the pulmonary vein in the left superior lobe; ligation of the whole pulmonary vein near the hilum of the lung in the left superior lobe. Also on the arteries these experiments were made: ligation of the whole pulmonary artery leading to the left lung; ligation of the arterial branch distributing in the lower lobe; ligation of the small arterial branch in the left lung apex.

The lungs were examined after fixation in formalin by the Van Giessen and Weigert methods.

Ligation of one branch or of the pulmonary vein *in toto* is not a severe operation in the rabbit. Following the operation there is well manifested congestion followed successively by connective tissue formation, constriction of the alveoli and bronchial desquamation. In a more advanced period the connective tissue formation is very marked around the vessels and bronchi which are strangu-

lated. All the newly formed connective tissue network which invades the whole parenchyma appears to originate from this perivascular and peribronchial connective tissue. This finding is in complete contrast with that of Stretti, who finds that this tissue production is referable to the visceral pleura.

Marked alterations are also found in the elastic tissue.

The results of ligating arterial branches differ totally from those obtained by ligating the venous branches. In about 25 experiments made on rabbits by ligating the venous branches, only one died from a diffuse pleuropurulent process. Of 50 rabbits in which the authors ligated the arterial branches, all died within five to twenty days of acute purulent inflammatory processes accompanied by severe hæmorrhage and numerous infarcts. Repeated experiments have satisfied the authors that these results were due neither to faulty technique nor failure of asepsis, but are a consequence of the ligation itself. The results of ligation of the branches of the pulmonary artery differ totally from those obtained by Bruns, Sauerbruch, Schumacher, and Kawamura. In the experiments of these authors other animals than rabbits were used; the authors also used no apparatus for the production of bronchial hyperpressure during the operation, as did the others referred to.

They draw these conclusions from their study:

1. Ligation of branches of the pulmonary vein causes sclerosis in the corresponding area.
2. This sclerosis becomes more and more accentuated as time elapses.
3. Ligation of the venous branches is not a dangerous operation in rabbits.
4. Ligation of the branches of the pulmonary artery in these animals is constantly fatal, owing to severe lesions of the corresponding lung and of the pleura. The alterations consist mostly in purulent inflammatory processes and infarcts, abscesses, and gangrene.

W. A. BRENNAN.

**Smith, A. L.: Postoperative Pulmonary Embolism Due to the Condition of the Blood.** *Brit. M. J.*, 1918, i, 644.

Early in his career as an abdominal surgeon, as well as consultant in obstetrics, the author came to the conclusion that the tragic deaths from pulmonary embolism, both after operations and confinements, were due principally to a hyperfibrinous condition of the blood; and he has taken the precaution to see that all his patients were allowed to drink freely. He also urges that the position of the patients be changed frequently and that they move their limbs freely as soon as they are able to do so, and most important, that they sit upon a chamber in bed to pass water and move the bowels. Lying on the back for ten days, with the blood getting more clottable daily is a very good way to bring about thrombosis and death by embolism when the patient begins to move about.



Pulmonary embolism is rare, only 47 deaths having occurred from it at the Mayo Clinic in 63,000 operations. In former days when the accident was more frequent, it was the custom to prepare the patient by drastic hydragogue catharsis for a day or two before. Then again hæmorrhage was more frequent and more abundant; the operating rooms were kept at 80° so that the patient lost a large amount of water by the skin, while vomiting from the anæsthetic prevented replacement of the lost water. For this reason the author believes that the chances of embolism would be greatly lessened if a rectal enema were given by the slow method at the rate of 20 ounces of beef tea or salt solution for every half hour that the operation lasts. If given at

a temperature of 105° F., it would practically do away with shock and subnormal temperature.

His conclusions are in part as follows:

1. Have the full normal proportion of water in the blood before operating.
2. Replace by rectum the amount of liquid lost by vomiting, catharsis, sweating, hæmorrhage and urine.
3. Encourage the patient to move the limbs freely.
4. Give the patient an abundance of water between meals and during the night.
5. Speedy operating lessens embolism because it means less hæmorrhage, less sweating, and less loss of water from the system.

V. C. HUNT.

## SURGERY OF THE ABDOMEN

### ABDOMINAL WALL AND PERITONEUM

**Rivarola, R. A.: Gonorrhœal Peritonitis** (Peritonitis gonococcica). *Rev. Asoc. méd. argent.*, Buenos Aires, 1918, xxviii, 478.

A girl aged eight years came to the hospital with symptoms of peritonitis. The only important personal antecedent was a gonorrhœal vulvovaginitis. On laparotomy the abdominal cavity was seen to be totally invaded by serofibrinous pus. Repeated examinations of the pus showed the presence of the Neisser gonococcus. Peritoneal lavage with permanganate of potash and protargol effected a slow and permanent recovery.

The author refers to a few other cases of gonorrhœal peritonitis which have been reported to him. In his own case he thinks that the infection travelled by the genital route; also that many of the cases of peritonitis which are met with in children of from four to twelve years of age are of gonorrhœal origin, which is not detected owing to the absence of a minute examination. Gonorrhœal vulvovaginitis is common within these ages. W. A. BRENNAN.

**Pfahler, G. E.: Four Cases of General Carcinoma of the Peritoneum with Remarkable Results from Deep Roentgenotherapy.** *Am. J. Roentgenol.*, 1918, v, 319.

The author states:

"The surprisingly good results obtained from the application of deep roentgenotherapy will, I believe, justify me in placing these four cases on record. The results are brilliant in so far as they surpass every other form of treatment. In fact, nothing else seems to offer any hope whatever. This record will justify hope of prolongation of life and relief of symptoms in a class of cases which formerly were given up almost without effort."

Detailed case histories are given, together with the results obtained. Regarding the technique employed, the abdomen is divided into from twenty to thirty areas so that every part of it receives

treatment anteriorly and posteriorly. A preliminary examination of the chest was made in each case to exclude metastasis. Forty milliampere minutes' exposure were given with a focal distance of eight inches, and a voltage equivalent to a nine-inch parallel spark gap. The rays are filtered through six millimeters of aluminum or glass.

In conclusion the author states:

1. General carcinomatosis of the peritoneum will sometimes yield remarkably to the influence of deep roentgenotherapy.

2. The prognosis, however, must always be most guarded, because this is metastatic carcinoma, and as such is liable to make its appearance elsewhere in the body, even though marked response is obtained from abdominal treatment.

3. Colloid carcinoma appears to be more responsive to roentgenotherapy than other forms of abdominal carcinoma.

ADOLPH HARTUNG.

**Berea, U.: Crural Hernia Treated by the Abdominal Route Simultaneously with the Dartigues Operation for Retroverted Uterus** (Hernia crural tratada por via intra-abdominal al practicar la operacion de Dartigues para las retro desviaciones del utero). *Rev. argent. de obst. y ginec.*, Buenos Aires, 1918, ii, 250.

In a case which on examination showed the uterus in retroflexion and a swelling in the right angle below Poupart's ligament, operation was done by the abdominal route, the incision being in the midline. The adnexæ were strongly attached to the sigmoid and rectum by dense adhesions. There was fluid in the pelvis and serous cysts about both ovaries. The latter were drained, and the retroverted uterus placed in correct position. Douglas's pouch was obliterated by adhesions. A crural hernia sac was isolated, inverted, partly ligated and extirpated, the orifice closed and the stump of the sac sutured to the uterus.

The author states that in cases in which a suprapubic laparotomy is necessary for the less severe

lesions of the lower abdomen, a crural or inguinal hernia can at the same time be radically dealt with, without the necessity for a separate incision.

W. A. BRENNAN.

**Eisenberg, A. A., and Schlink, H. A.: Mesenteric Vascular Occlusion.** *Surg., Gynec. & Obst.*, 1918, xxvii, 66.

After explaining the condition, three case histories are given and the pathogenesis, pathology, symptomatology, diagnosis and treatment are discussed.

Mesenteric venous occlusion occurs in about 40 per cent of all cases of mesenteric occlusion. Both the superior and inferior veins are generally simultaneously involved. The common causes of venous mesenteric occlusion are descending portal thrombosis, and more rarely (about 30 per cent) a primary condition due to phlebitis resulting from an infectious process in the intestine. It most often follows appendicitis.

2. Mesenteric arterial occlusion generally affects the superior mesenteric artery because of its size, more parallel course to the aorta, and its branching off before the inferior mesenteric artery. A hæmorrhagic infarct is formed, the reason for which is not certain. The embolus causing the condition has its origin from acute and chronic endocarditis affecting the mitral and aortic valves most commonly, also atheroma of the aorta, and rarely from pulmonary emboli. Some have occlusion of both the veins and the arteries.

The pathological anatomy depends upon the extent of the lesion and the length of time the condition has existed. It varies from œdema, blood extravasations and infarcts, to gangrene of a small or large area of bowel.

The symptoms of greatest importance in diagnosis are:

1. Very severe colic-like abdominal pain.
2. Distention of the abdomen, with tenderness, tympanites, and occasionally shifting dullness.
3. Rapid and excessive fall of temperature associated with a weak and rapid pulse.
4. Copious melæna with diarrhœa followed by constipation.
5. Persistent vomiting.
6. Palpable tumor due to the formation of a large hæmatoma between the layers of the mesentery.
7. Appearance of the patient manifesting grave constitutional disturbances.

8. Source for the embolus, e. g., endocarditis.

9. Age of the patient, usually over twenty years.

The condition must be differentiated from intussusception, volvulus, certain pathological conditions which may follow an attack of acute appendicitis, acute pancreatitis, and typhoid fever with perforation.

The treatment is surgical if diagnosed and operated upon early. If not too large an area is involved, a rapid resection gives the patient the best chances

of recovery. Some cases have been reported as recovering under the expectant treatment, but the diagnosis obviously may be questioned.

The following conclusions are drawn:

1. Mesenteric vascular occlusion is not an extremely rare condition, there now being collected about 400 cases.

2. The occlusion is most frequently in the arteries.

3. By far the most common lesion produced is hæmorrhagic infarction of the intestine.

4. The most common cause of the occlusion is embolism resulting from infection and injury.

5. There is no difference clinically between the arterial and venous occlusion, regardless of whether it is due to embolism or thrombosis, in the superior or inferior vessels.

6. The clinical diagnosis should be made on sudden onset, acute colic-like abdominal pain, distention and tenderness, signs of shock and collapse; often there may be vomiting and constipation; if diarrhœa is present, it is almost always accompanied by melæna.

CARL R. STEINKE.

**Carson, H. W.: The Clinical Aspects of Tuberculous Mesenteric Glands.** *Lancet*, Lond., 1918, cxciv, 869.

The condition, according to the author, is much more common than is generally believed. Its apparent rarity may be explained by the fact that unless complications occur, the symptoms are so elusive, or rather point so indefinitely to any particular disorder, that they are classed under the general term of "indigestion," and no attempt at differential diagnosis is made.

The main symptom is pain, and its character is absolutely typical. It is a sudden centralized abdominal pain severe enough to make the patient cry, lasting about fifteen minutes or less, relieved by pressure or hot applications, recurring perhaps two or three times a day, and stopping as suddenly as it began, so that in the intervals the patient is quite free. In some cases the pain occurs every day, in others only at intervals of a month or so, the attack lasting two or three days. Vomiting occurred at the time of the pain in 13 of the 39 typical cases.

The condition must be differentiated from (1) appendicitis; (2) stone in the ureter; (3) digestive disorders; (4) intestinal parasites; and (5) lead poisoning.

The condition is often associated with complications such as adhesions, kink, adherent Meckel's diverticulum, free fluid, intussusception, intestinal obstruction, etc. In treating the uncomplicated cases, the abdomen is opened in the midline below the umbilicus and the mesentery is examined, beginning at the ileocæcal junction. Any caseating or calcareous glands are removed by dissection, which may be rather tedious. Any rent in the mesentery is repaired with fine catgut. All glands must be removed. Other signs of tuberculosis are looked for, the appendix removed, and the abdomen closed.



In dealing with the complications, ordinary surgical principles apply.

The author sets forth the following conclusions:

1. The mesenteric glands may be the only part of the body affected by the tubercle, and especially they may be affected apart from tuberculous peritonitis.

2. There is a tendency to spontaneous recovery, as is evidenced by calcification.

3. The condition is not limited to childhood.

4. A diagnosis can be made with reasonable certainty without the presence of a palpable tumor.

5. Pain is characteristic in type and is due to spasm of the affected segment of small intestine.

6. The spasm may give rise to intussusception.

7. Complications are frequent and may be serious.

8. The caseating form of tuberculous peritonitis is probably the last stage of caseating mesenteric glands.

9. Operative treatment should be undertaken owing to the difficulty of excluding complications in apparently typical cases, and such treatment gives good prospect of permanent cure.

J. L. BUTSCH.

#### GASTRO-INTESTINAL TRACT

**Ratera, I., and Ratera, S.: Radiologic Exploration of the Stomach** (Exploracion radiologica del estomago). *Arch. españ. de apar. digest.*, Madrid, 1918, i, 199.

The authors enumerate and describe the modifications in the form and topography of the stomach and neighboring organs in constitutional ptosis, gastropotosis, atony, ectasia, and gastric ulcers, and dwell on the radiologic showings in each of these types.

There is great difficulty in differential diagnosis, particularly from gastric carcinoma; but diagnosis is important because it indicates the choice of operation, its limits, and the chances and nature of recovery.

There are two types of gastric carcinoma: the fungoid and the scirrhus. The first is characterized by the relief in which the gastric cavity is shown at the fluoroscopic examination. Scirrhus carcinoma has two characteristic symptoms: the rigid infiltration of the gastric walls, and the almost concentric stricture of the lumen.

The early diagnosis of gastric carcinoma, as Castle indicated, is based on the functional alterations in the organ, especially the motor function. A period of expulsion less than two hours corresponds to an acceleration of this function; if the time of expulsion exceeds three and a half or four hours there is a delay in the evacuation of food. Acceleration may be due to relaxation of the pyloric sphincter in cases of rigid pyloric dilatation, insufficiency by achylia, or increased energy of the cardiac contractions. Retardation may be due to contracted pyloric opening or to diminished motor

power of the stomach. In severe gastric atony there is retardation with weak peristaltic contractions; but if the contractions are intense, the condition is more likely to be hyperacidity or pyloric spasm. In early pyloric stenosis, even though no functional alteration may exist in the stomach, there may be slight retardation in the passage of food.

Remnants of food in the stomach for twelve hours may be due to organic or reflex causes; if it exceeds twelve hours, the retention is due to stenosis of gastric origin. Care must be observed as regards negative findings, as there are acute ulcers which do not show any changes in the gastric picture on the screen.

Although the radiologic findings are of the greatest importance in the diagnosis and treatment of many gastric affections, when it is a question of an acute ulcer or a small carcinoma in the pyloric region, the study of the gastric chemistry alone will give an early indication of the existing condition.

W. A. BRENNAN.

**Downes, W. A.: Results Obtained in 17 Cases of Hour-Glass Stomach by Operation.** *Am. J. Surg.*, 1918, xxxii, 150.

The observations set forth in this paper are based upon the operative results obtained with seventeen patients having an hour-glass contraction of the stomach following benign ulcer. Fifteen of these were observed for an average period of two and one-half years after operation, and one for more than nine years. There were 16 females and 1 male in this series. The average age was thirty-nine years. There was one operative death, the seventeenth patient dying from pneumonia on the sixth day after mediogastric resection.

Downes believes that well-taken radiograms not only establish the diagnosis at once, but give a fairly accurate idea as to the relative size and shape of the pouches, the width of the channel connecting them, and the condition of the pylorus. This information gained beforehand is of great assistance to the surgeon in determining the best suited operative procedure.

At least four operative procedures: gastro-enterostomy, gastroplasty, gastrogastrostomy, and medio-gastric resection or resection in continuity, are available in the treatment of hour-glass contraction. According to the author pylorotomy should be added to these as the method to be adopted if the constriction is near the pylorus, thus forming a small distal pouch. He had no case of simple stricture in which the latter operation seemed to be indicated.

Gastro-enterostomy alone was employed six times, and once was combined with gastroplasty. As a rule the intestine should be anastomosed to the cardiac pouch. As an exception the author cites a single instance when the constriction occupied the middle third of the stomach and was caused to a large extent by perigastric adhesions. There was

marked infiltration of the walls of both pouches, proved subsequently to be syphilitic, with a large retention in the lower pouch and no retention in the upper pouch. After the channel connecting the pouches had been sufficiently freed to admit three fingers, the gastro-enterostomy was made to the pyloric pouch. This patient died one and a half years later of a generalized syphilis; all symptoms referable to the stomach had been entirely relieved.

Failure to note stenosis at the pylorus once necessitated a second operation to relieve stasis in the pyloric pouch. With this exception, the results following gastro-enterostomy have been satisfactory in every way. This operation is indicated, Downes believes, when the constricted area is of wide extent, and when the adhesions prevent mobilization of both pouches.

The author thinks that gastropasty has a limited field in the treatment of hour-glass contraction, due to the fact that it is suitable only when the pouches are movable, their walls free from induration, and the constricted area narrow. It may be combined with pyloroplasty or gastro-enterostomy if the pylorus is stenosed. Four of his patients were operated upon by this method. In one the cautery was applied to the ulcer and gastro-enterostomy added, in two the ulcer was excised, and in the fourth gastropasty was combined with pyloroplasty after simple gastro-enterostomy had proved unsatisfactory. The end-results in this group have been most satisfactory, although in one the hour-glass deformity to a certain extent persists to the present time, three and one-half years after operation.

Gastrogastrostomy, he believes, is especially adapted when the stomach is adherent along its lesser curvature to the liver, when the pouches are relatively large, nearly equal in size, and can be approximated at their dependent portions. The stomach wall should be free from induration at the site selected for the anastomosis. The pylorus must be patent; otherwise pyloroplasty or gastro-enterostomy will have to be added. Gastrogastrostomy was performed three times in his series, with complete clinical recovery in each instance. One of these patients has been followed for nearly nine years.

According to his views, mediogastric resection or resection in continuity is the ideal operation for hour-glass deformity of the stomach, provided the pylorus is not stenosed, and should be performed under such conditions. The ulcerated area, active or quiescent, as well as the constricted portion of the stomach wall is removed by this method. The end-results obtained demonstrate the value of this procedure. Unfortunately, it is limited to the patients with few adhesions when the pouches are fairly large and permit of free mobilization. It is a longer and somewhat more difficult operation to perform than those already mentioned, and for this reason, if the patient is in poor condition, should not be given preference over them. In order to overcome the

tendency for the constriction to persist after resection in continuity, a wide excision should be made.

Midgastric resection was the method adopted for five patients. Three perfect results seem to have been obtained; one patient has worked continuously as a domestic for over three years; another for two and one-half years; and the third operated upon eight months ago has gained twenty pounds in weight. All symptoms referable to the stomach have disappeared. The fourth patient referred to, in which the radiograph shows a persistence of the deformity, continues to have some distress in the stomach after meals, although there has been no vomiting. She has gained in weight and has continued her work. The fifth died of pneumonia on the sixth day after operation. This patient was not in good condition and a less severe operation should have been performed.

The fifteen patients of this series surviving to the present time have been examined and checked by radiographs during the past few weeks. All have gained in weight, and with the one exception noted are practically free from the symptoms for which they sought relief.

E. C. ROBITSHEK.

**Scott, A. J.: Hypertrophic Pyloric Stenosis in a Two-Year Old Child; Report of a Case. *J. Am. M. Ass.*, 1918, lxx, 1913.**

Hypertrophic pyloric stenosis is common in children before the second or third month, and in young adults. Beardsley, however, reported a case in which a boy showed symptoms shortly after birth and up to his death at the age of five years. Shaw and Elting reported a case in 1904 of a patient from the seventh or eighth month, successfully operated upon at sixteen months. Arreger's case also is that of a child of five years; and Rosenheim cites an instance in which the patient had had no symptoms until he was three years old, and at the age of five showed the first marked symptoms; he was operated upon at the age of six and one-half years.

The author cites a case of interest. A Jewish boy, aged twenty-two and one-half months, was brought to the observation cottage July 22, 1917, with a complaint of vomiting, loss of weight, and extreme restlessness.

The child had been fed on a diet of oatmeal and cow's milk for the first three months at home. Milk of magnesia had corrected constipation, the only apparent ailment during this period.

Two or three different women boarded the child after that time, and at the age of ten months, during the teething period, he was very skinny, vomited at times, and had a good deal of gas. When he was about fifteen months old, he had whooping cough with a few attacks of vomiting. Later he was kept in the Children's Hospital; he had attacks of nausea without showing signs of vomiting, but began to vomit two days after his return home. A physical examination at that time was negative except for a scaphoid abdomen with visible peristaltic waves



but no palpable tumor. A fluoroscopic examination was made and nothing was seen to pass through the pylorus.

Tincture of belladonna and milk, also nutritive enemata, were given with varying results. Temperature varied from 101° F. to normal.

Stomach washings of soda water, followed by barley water and egg albumin administrations at intervals, were given; this gave relief at first but later did not satisfy. An operation on July 28 revealed a typical hypertrophied pylorus such as is seen in congenital pyloric stenosis. Nothing but thickened tissue was found to account for the obstruction. The child died the following day, but might have been saved by an early operation. The condition of hypertrophic pyloric stenosis may obtain for months or years with very mild symptoms, or none at all.

F. P. HAMMOND.

**Lewisohn, R.: The Value of Pyloric Exclusion in the Treatment of Pyloric and Duodenal Ulcers.**  
*Ann. Surg., Phila., 1918, lxvii, 560.*

The indications and contra-indications for performing gastro-enterostomy and its beneficial effects with exclusion of the pylorus are discussed by the author. "The great value of gastro-enterostomy in the treatment of pyloric stenosis is an undisputed fact," he says. If the obstruction is caused by a malignant growth, the results will be of temporary benefit. If the obstruction is of benign origin such as results from pyloric or duodenal ulcer, the benefit is permanent. The benefit derived from gastro-enterostomy when an obstruction exists is greater than if it is done for a gastric or duodenal ulcer.

Gastro-enterostomy is a drainage operation when the pylorus is obstructed. The distress and pain are caused by the passage of food over the ulcer-bearing area. The great majority of ulcers do not cause obstruction. Simple gastro-enterostomy for duodenal or gastric ulcer would be indicated if all the food could be diverted, but this has been proven impossible, since food will pass through the pylorus after gastro-enterostomy has been performed. Hartmann pointed out that if the anastomosis is made at the pylorus, the evacuation takes place through the stomach; if the anastomosis is made at the fundus of the stomach, the food will pass out through the pyloric antrum. He quotes Guibe, Cannon, Haertel, and others to confirm the contention that when the pylorus is open, food will not pass through the artificial opening.

The author advises closure of the pylorus and claims these advantages: first, if food can be prevented from passing over the ulcer-bearing area, even for a short time, the healing process is hastened. Second, bile and pancreatic juice are regurgitated through the stomach, thus diminishing the hyperacidity. The pylorus is excluded by using the Berg stitch which is introduced in the following manner: "A double Pagenstecher linen suture, armed with a needle, is carried around the posterior

stomach wall and is held in place by taking several bites in the anterior wall of the stomach. The suture is then tied and the pylorus thus occluded; the knot is buried by a few single stitches."

The efficiency of this closure was tested by staining the food with thionine blue. This dye has a specific affinity for mucus. The author submits two figures from experimental specimens upon dogs. The first figure shows a gastro-enterostomy with pyloric exclusion. The stomach mucosa as well as the jejunal shows an intense blue stain. The duodenal mucosa is slightly colored. The second figure shows a gastro-enterostomy without pyloric exclusion. The stomach, duodenum and jejunal mucosa are stained equally. The first figure is intended to show the efficacy of the exclusion. The second is intended to show that when the pylorus is not excluded, food will pass through it.

M. A. BERNSTEIN.

**Wood, W. Q.: Perforated Gastric and Duodenal Ulcer.**  
*Edinb. M. J., 1918, xx, 358.*

Perforation of an ulcer of the stomach or duodenum puts the patient's life in greatest jeopardy. Symptoms of perforation are usually so severe in their onset that immediate medical aid is sought. Since the outbreak of the war a large proportion of the male civil population has now been called into the army, so cases of perforated ulcer in these men are dealt with in military hospitals. Gastric ulcer is more common in women than in men and perforation is also more frequent.

The author examined and recorded 20 cases of gastric perforations, 11 in males and 9 in females, which reversal of the usual order is all the more striking because of the large proportion of men who are absent in military service. Duodenal ulcer is more common in the male sex than in the female.

It has been proven by examination of patients from eighteen to sixty-nine years that the prognosis in cases of perforated ulcer is not necessarily affected to any great extent by the age of the patient. Neither does the occupation of the patient seem to have any bearing on the liability of the ulcer to perforation. In 20 of 30 cases there was a previous history of well marked dyspeptic symptoms which had been present for a period varying from a few months to as long as ten years. In 9 of the cases there was definite history that the symptoms of indigestion had been more pronounced during the few days before perforation took place. Many of these patients were definite about the fact that this exacerbation was more severe than any they had previously experienced. No constant factor concerning the agency of perforation can be discovered from a review of the present cases.

Symptoms following perforation are similar. Agonizing pain is always the outstanding fact. The pain is referred to the upper part of the abdomen, and usually attains its maximum severity in the region of the ulcer, though not localized to any point. Distinct shock is usually presented by the



patient in the first few hours after perforation with temperature frequently subnormal, but in spite of the intense pain and the shock, the pulse shows little alteration either in volume or frequency. However, when the infection of the peritoneum begins to manifest itself, the pulse increases in rate and deteriorates in quality. Abdominal rigidity to an extreme degree is the most striking feature. The abdominal wall and the diaphragm remain immobile, the respiratory movements being carried out mainly by the thoracic muscles. Both tenderness and rigidity are most marked in the upper part of the abdomen and may serve as a guide to the position of the ulcer.

Anæsthesia was induced with chloroform and continued by ether administered by the open method in the author's cases. Chloroform is given until the abdomen is opened and ether is then substituted.

A midline incision above the umbilicus was employed in all cases. A small midline incision a short distance above the symphysis pubis is of value in doubtful cases.

The peritoneal exudate in most cases was of a slightly turbid serous character. The size of the opening varied from that of a pin hole to the size of a shilling. Large perforations are usually fatal.

In all the 20 cases of perforated gastric ulcer the perforation was found by the author to be situated on the anterior surface of the stomach. In every case the ulcer has been closed by the introduction of a through-and-through suture of catgut inserted some little distance away from the margin of the ulcer. A double layer of Lembert sutures of silk is then inserted in the long axis of the viscus.

Cleansing of the peritoneal cavity has been accomplished with good results by mopping up the excess of exudate in the region of the ulcer with gauze swabs. Drainage may be done satisfactorily by means of two glass tubes; one passes into the pouch of Douglas from a midline incision above the symphysis pubis, the other into the right or left kidney pouch, according to the site of the ulcer.

Ulceration that has surgical treatment within twelve hours after perforation gives the patient more chance of recovery than longer periods, according to records.

F. P. HAMMOND.

**Dragstedt, C. A., and Moorhead, J. J.: Immunity in Intestinal Obstruction.** *J. Exp. Med.*, 1918, xxvii, 359.

During the past few years a large amount of experimental work has been done in order to solve the problem of the cause of death in intestinal obstruction. This work has added to the knowledge of the physiology of the intestinal tract, but the cause of death from intestinal obstruction still remains unknown. It is generally conceded that a systemic bacterial invasion by the organisms of the obstructed intestine does not occur, and most of the clinical and experimental evidences so far obtained point to a quickly developing and rapidly

fatal toxæmia. The nature of the toxin is disputed, and investigations on this point thus far reported are not conclusive.

To further advance the knowledge of this important subject, the authors undertook a series of experiments on dogs. Recognizing the fact that the symptoms caused by a closed intestinal loop, whether produced by ligature and a reconstruction of the gastro-intestinal tract by gastro-enterostomy, or by resection of the loop and an end-to-end anastomosis of the intestine, parallel closely the symptoms of acute intestinal obstruction, they used the following control procedures: (1) the production of open intestinal loops; (2) the antemortem removal of closed intestinal loops; (3) the production of a blind duodenal stump; (4) ligature of the duodenum with no anastomosis; (5) injection of the material from closed intestinal loops.

As a result of this careful and exhaustive study the authors seem to have demonstrated that with few exceptions immunized dogs showed no greater resistance to subsequent obstruction than normal dogs, and in many instances they showed less. Two dogs that recovered from a ligation of the duodenum survived a closed unwashed duodenal loop, and are still living after three months. Upon later examination these loops were found to be only moderately distended and of good color.

So far they have had no normal dogs survive a closed duodenal loop to this extent, but they are inclined to believe that the previous obstruction has altered the secretion-absorption ratio so that upon production of a closed loop there was no distention with consequent tissue necrosis, inasmuch as Sweet, Peet, and Hendrix report several instances of a normal dog surviving closed loops, and Dragstedt, Moorhead, and Burcky have shown that dogs can survive closed loops washed with ether. They do not consider that any immunity is shown by these cases. One dog immunized by injection survived a blind duodenal stump indefinitely. Controls have done this, however, and this is, therefore, no indication of an increased resistance.

Of the 29 closed loops produced in immune dogs, 21 were found to be perforated after death. This gives a percentage of 72 for dogs dying of perforative peritonitis, which is no higher than that in control dogs and indicates that the immune dogs have no greater resistance to the toxæmia than control dogs.

There still remains the possibility of an increased tolerance to the poison of intestinal obstruction. It is well known that carrion-eating animals can ingest quantities of putrefying protein that would poison man. What is the nature of the resistance to the poisons, and is it possible that dogs recovered from intestinal obstruction might show a slightly increased tolerance to a later similar condition?

The author's experiments so far do not indicate an increased tolerance, but if there is a tolerance of slight grade, it would take a great many experiments to demonstrate it. It this should prove to



be the case, they believe that their work warrants the statement that the increased tolerance is due to some variable factor, such as diminished absorption in that section of intestine which was affected by the obstruction, since an increased tolerance has not been noticeable in a great number of the experiments.

The following conclusions are drawn:

1. There is no increased immunity or tolerance to intestinal obstruction after recovery from previous obstruction.

2. Dogs recovered from intestinal obstruction are not more resistant to injections of closed loop fluid than normal dogs.

3. Dogs injected with closed loop fluid are not more resistant to intestinal obstruction than normal dogs.

4. In dogs the normal variation in resistance both to intestinal obstruction and to the injection of closed loop fluid is large. GEORGE E. BELBY.

**Hubeny, M. J.: The Appendix with Especial Reference to Peristalsis.** *Am. J. Roentgenol.*, 1918, v, 293.

In the first paragraph, the author points out the necessity for a correct differential diagnosis before operating for a chronic appendix, and he feels that the roentgenologic examination offers very tangible help in this. The anatomy of the appendix and the physiology is discussed at length, especially the latter. The conclusions of Berry and Lack as to the function of the appendix are given under six headings. The opinions of Morgera, Heile, Waller and Kieth are also given.

The author has been able to verify the claim of Waller that the appendix has a distinct peristalsis. The article states that the appendix can be filled by two methods, one by the opaque enema and the other by the opaque meal. It is the experience of many roentgenologists that the appendix is not at all, or at least rarely, filled by the enema method of barium study of the colon. The failure of the appendix to fill with the barium is explained, first, by obliteration of the lumen, secondly, by infiltration of the mucous membrane, and thirdly, by an enterolith or previously contained food matter. This explains the demonstration of a filled appendix at second and third examinations, when the first was a failure in this regard.

The points to be derived from a fluoroscopic study of the barium-filled structures in the right lower quadrant are given in detail.

The author's conclusions are as follows:

1. Because the appendix may have a physiological function, it should be studied roentgenologically before removal in chronic cases.

2. Because it possesses peristalsis, the roentgen demonstration of appendiceal retention or rapid expulsion of barium is of diagnostic value.

3. Because of its reflex influence over the alimentary tract, the appendix should be investigated by the barium method in many diseases of the stomach and intestines.

4. Because of its anatomical relation to the cæcum, the location of the appendix can be determined approximately, even when not visible on plate or screen.

5. When barium-filled, the appendix can be studied by the screen in great detail and accurately palpated for pressure-pain and adhesions.

W. A. EVANS.

**Wood, W. Q.: The Treatment of Acute Appendicitis.** *Edinb. M. J.*, 1918, xxi, 3.

The author analyzes as to mortality, pathology, treatment, and postoperative complications 221 cases of acute appendicitis operated upon by him. The cases are grouped under three heads: (1) early cases, in which the appendix is in a state of catarrhal inflammation; (2) cases in which the infection has spread through the wall of the appendix to the surrounding peritoneum, and is still actively spreading; and (3) cases with localized abscess.

A review of the statistics on mortality from acute appendicitis is given. In the author's series of cases the mortality was 5.88 per cent. There were 90 cases without obvious infection of the peritoneum, all of whom recovered. Of definitely localized appendix abscesses there were 10 cases with no fatalities. There were 121 cases with infection of the peritoneum, and all of the fatal cases belong to this group, the mortality being 10.74 per cent. The majority of these cases showed marked infection of the peritoneum.

The appendix was gangrenous in 53 and perforated without extensive gangrene in 13. The lesson to be learned from the review of these statistics is the oft repeated one of the necessity for early operation.

Acute appendicular obstruction is comparatively common, and Wilke has pointed out that the symptoms are quite characteristic. The pain is of unusually sudden onset and very severe, localized tenderness is marked, temperature is normal or subnormal, and the pulse is little altered in frequency.

All of the cases that died had a well marked peritoneal infection. One patient died on the operating table, two were moribund at the time of operation, one had a badly compensated heart, two died from intestinal obstruction, one died from a cellulitis starting in the region of the wound, and the remaining six died of peritonitis.

The gridiron incision was employed in the majority of cases and the author found little trouble in obtaining sufficient exposure through this incision. In the early cases without peritoneal involvement, the abdomen is always completely closed. In treating the second type of case, the essential steps are to remove the appendix with as little disturbance to the surrounding parts as possible, to cleanse the peritoneum, and to provide free drainage of the infected area. In providing for drainage, an additional small incision is made above the symphysis pubis in cases of widespread peritonitis, and a glass tube is passed down to the pouch of Douglas.

A rubber, or occasionally a glass tube, is left in the appendix wound. The glass tube is replaced in forty-eight hours by a rubber tube which is gradually shortened but not removed until the discharge of pus has almost ceased.

The essential point in dealing with an appendix abscess is to avoid infection of the general peritoneal cavity. The appendix may be removed if it is in an easily accessible position, but if it is firmly embedded in adhesions, it is much better left alone. After the peritoneum is closed in infected cases, the wound is washed with a solution of spirits containing biniodide of mercury.

There were few postoperative complications. One patient developed a secondary residual pelvic abscess. Acute intestinal obstruction occurred in four cases. In operating for obstruction due to adhesions Wood leaves a quantity of oil of vaseline in the peritoneal cavity as recommended by Wilkie. Fæcal fistula developed in four cases, and incisional hernia in five.

E. C. ROOS.

**Castro, A.: Appendicectomy in Antioquia** (Appendicetomia in Antioquia). *Rev. clin. Medellín*, 1918, iii, 394.

Castro reviews the history of operation for appendicitis in Antioquia. He reviews 228 operations, 36 for abscess of the appendix, 28 for acute appendicitis, and 120 for chronic appendicitis. In 46 cases the appendicectomy was associated with another operation. There were 18 deaths in the series.

He draws these conclusions:

1. Appendicitis is most frequent between the twentieth and thirtieth year. It is more frequent in the female than in the male, owing to adnexial disturbances. Chronic appendicitis is the commonest form.
2. When chronic appendicitis is diagnosed, it should always be operated upon; acute appendicitis should be operated upon within the first twenty-four hours, but not if thirty-six hours have passed.
3. Every appendicular abscess has an immediate or proximate gravity and exposes the patient to multiple disturbances.
4. In women, when the right adnexæ are compromised, the appendix is very frequently affected.
5. Gonorrhœa is a frequent cause of appendicitis in women.
6. The appendix need not always be removed as a routine measure when the abdomen is opened.
7. Appendicitis often causes complex symptoms.
8. Benign symptoms in acute appendicitis do not always mean a benign attack.
9. Enteroliths and fæcal material are frequent in the appendix.
10. Appendicitis is frequent during pregnancy. Tubal pregnancy of the right side compromises the appendix. A pregnant woman with appendicitis should be operated upon.
11. Appendicular constricting bands ought always to be sectioned.

12. Appendicectomy in chronic appendicitis is a mild operation.

13. Infection is the principal cause of appendicitis. Tonsillar, rhinopharyngeal, rheumatic and grippal infections favor appendicular attacks or are the cause of them.

14. Medical treatment does not give satisfactory results in chronic appendicitis.

15. The McBurney incision is the best for a simple appendicitis; the Jalaguier incision should be used when it is necessary to explore, or when the patient has very thick abdominal walls.

W. A. BRENNAN.

**Kenny, T., and Segura, G.: Fibrosarcoma of the Rectum** (Fibrosarcoma de recto). *Rev. Asoc. méd. argent.*, Buenos Aires, 1918, xxviii, 261.

The authors' case was in a man aged 57 years. He had been treated for hæmorrhoids, but owing to profuse hæmorrhage and the excision of a large mass of tissue, he came to the hospital. A large sessile tumor was found solidly implanted on the posterior face of rectum; it was lobulated, hard, and smooth. Histologic examination showed it to be a fibroma. It was removed following the Kraske technique. The man recovered after a protracted convalescence. More detailed examination of sections from the removed tumor showed elements of both sarcoma and fibroma. The authors discuss the question as to whether the sarcoma was primary or whether it was a sarcomatous degeneration of a fibroma. They believe it was the latter, based on the clinical history and some of the histologic findings.

The authors observe that benign fibromata developing in the gastro-intestinal tract are very rare. Quénu and Hartmann say that fibromata of the rectum would be considered frequent if one classed as such those fibrous pediculated growths which are observed pendant from the anus; however, according to their conception these are only hæmorrhoids which have undergone sclerous transformation. The authors refer to the few cases of pure fibrous tumors of the intestinal tract reported in literature.

Sarcoma of the gastro-intestinal tract is rather frequent, the great majority being melanotic. Melanosarcoma of the rectum is rare, and sarcoma which has not undergone such pigmentary degeneration is much more rare. In 1884 Tillaux was only able to gather in literature the cases reported by Tredeat, Watzlaffe, and Billroth. In Tredeat's case only was the tumor sessile and non-pedunculated, as in the case now reported.

The Kraske technique was followed in this case because the Kocher operation, resection of the rectum with preservation of the sphincter, was not practicable, and Quénu and Hartmann's perineo-abdominal technique was not indicated. The authors know of no other case of a sarcoma or a fibroma removed by the Kraske method.

Two years after operation the man was in perfect health and showed no signs of recurrence.

W. A. BRENNAN.



**Larrainzar, A. S.: Surgical Treatment of Rectal Prolapse** (Tratamiento quirúrgico del prolapso rectal). *Rev. de cien. méd.*, Barcelona, 1918, xlv, 201.

The author reviews the etiology, frequency, and treatment of rectal prolapse.

The treatment by resection according to the Mikulicz method not alone runs the risk of recurrence but also that of infection, on account of the opening of the peritoneum in a region proximal to the anus. The operation has a high mortality, 10.9 per cent, and it should only be applied when other methods are not applicable.

The methods of suspension (rectopexy) are objectionable because they have no physiological basis, and because recurrence is very frequent, 47 to 59 per cent. These methods do not merit their extensive employment, especially in France.

The methods based on anal stricture, of which Thiersch is the principal exponent, have only limited application. They are useful in the case of athreptic children when a major operation is not possible.

This leaves four surgical methods available: (1) obliteration of Douglas' pouch; (2) the mucous resection of Rehn-Delorme; (3) plastics of the pelvic floor; and (4) paraffin injections. The first has only been done a few times and should be reserved for cases of extreme magnitude where replacement is clinically impossible. The Rehn-Delorme method is applicable in replaceable prolapses without complications. Recurrence is very rare. Nevertheless the method ought to be reserved for severe cases because in the dissection of the mucous membrane there is a vast loss of blood.

Regarding the frequency of rectal prolapse in children the author thinks that the paraffin injection of Bauer or Hoffmann's pelvic floor plastics might be employed.

The many combined procedures which have been employed are applicable only in the special circumstances arising. W. A. BRENNAN.

**Veyrasset: Abnormal Opening of Rectum into the Posterior Wall of the Vagina, with Complete Absence of an Anus** (Abouchement anormal du rectum dans le cul-de-sac postérieur du vagin; absence complète d'anūs). *Rev. méd. de la Suisse Rom.*, 1918, xxxviii, 433.

The child in the case reported was six months old when brought to the author. She had always had abdominal disturbances, and was emaciated. There was no trace of an anus. A high situated fistula of the posterior wall of the vagina was visible on examination by speculum, through which fluid matter intermittently passed into the vagina.

The author did a Rizzoli operation. This has been described by Kirrison as a "transplantation of the anus to the perineum." The operation is usually done after the first year, when the abnormal opening of the rectum permits sufficient evacuation for fæces. In the author's case the condition and age of the child and the small size of the orifice, as well as

the high situation of the rectovaginal fistula made the intervention very difficult and delicate.

The author calls attention to the necessity of a thorough examination of the genital organs and the anal region in nurslings who have faulty digestion and show progressive emaciation. W. A. BRENNAN.

## LIVER, PANCREAS, AND SPLEEN

**Love, R. J. M.: Amoebic Abscess of the Liver.** *Brit. M. J.*, 1918, i, 696.

In Mesopotamia amoebic abscess of the liver is not at all uncommon. Knowles and Cole state that the different species of amoebæ are all one and the same organism, *Entamoeba coli communis*. Probably the *Entamoeba* is on the same pathological basis as the *Bacillus coli*, and decreased resistance of the tissues or some stimulus applied to the organism causes it to become pathogenic, in which case the majority of the Mesopotamia Expeditionary Force are potential cases of liver abscess.

The patients with liver abscess usually give a history of former attacks of diarrhoea or actual passage of blood and mucus, and *Entamoeba histolytica* can usually be found in the stools. The onset of the disease is usually insidious, loss of appetite, malaise, or wasting causing the patient to report. In a few cases, however, the disease runs an acute course and the onset is surprisingly rapid. Cases are on record showing a duration of only eighteen days. Postmortem examination shows multiple abscesses, the pus of which contains amoebæ.

In the author's cases many of the patients showed multiple abscesses in contradiction to the usual textbook presentation of a solitary abscess. This is one of the reasons for the failure of drainage of an abscess to cure.

Pain is a marked symptom, and helps to locate the position of the abscess. It is especially marked if the abscess is near the surface of the liver. Pain in the right shoulder suggests subdiaphragmatic irritation of the phrenic nerve, whereas pain in the epigastrium or loins may indicate an abscess in the lower part of the liver. Vomiting occasionally occurs, but jaundice is rare. With an abscess of large size or long duration, cachexia and signs of septic absorption are well marked. The pulse-rate is often relatively slow.

The cytological examination of the blood shows a leucocytosis with an increase in the percentage of polymorphonuclear cells so characteristic of pus. The eosinophiles are not usually increased.

X-ray is of value in diagnosing abscess of the liver. The liver is usually increased in size in an upward direction. The movement of the diaphragm is limited on the abscess side. The normal dome-shaped outline of the diaphragm may be bulging showing the pointing of an abscess.

A small abscess may be absorbed, but the usual course is rapidly progressive. Some cases who had never before been out of England die within six months of amoebic abscess of the liver, the organism

being found in the pus of the abscess. In most cases the abscess apparently increases steadily in size and may rupture through the diaphragm or into the peritoneal cavity. Abscesses have been found which ruptured into the vena cava, the patient dying from hæmorrhage.

The diagnosis in well marked cases presents little difficulty; the enlargement of the liver, signs of toxæmia, the blood picture, and X-ray screen, all point to a correct diagnosis. At times it may be difficult to distinguish between a right-sided empyema and a liver abscess. If the abscess is situated in the upper right lobe of the liver, the lung may be compressed, with dullness and feeble breath sounds as high up as the angle of the scapula; also some fluid in the pleural sac may accompany a liver abscess. The exploring needle may have to be used to decide, the diagnosis resting on the site of the pus. If the abscess is in the lower part of the right lobe and situated near the midline, the diagnosis of enlarged and infected gall-bladder can easily be made. If the abscess is in the posterior part of the right lobe, the condition may simulate perinephritic abscess. The urinary tract should be examined and signs of psoas irritation looked for.

The prognosis is quite unfavorable. The reason is that although an abscess may be satisfactorily drained, others may be present which may have been undiscovered or undiagnosed. As many as five abscesses have been found postmortem.

J. L. BUTSCH.

**Smithies, F.: Cases Illustrating Disease of the Gall-Bladder and Consideration of 1,000 Cases of Gall-Bladder Disease.** *Surg. Clin. Chicago*, 1918, ii, 505.

Smithies divides his article into two parts, first, a consideration of six cases of gall-bladder disease; and second, a clinical consideration of gall-bladder disease based upon an analysis of 1,000 pathologically demonstrated instances of the affection.

His cases are as follows:

Case 1. Acute catarrhal cholecystitis in a young girl, with subsidence of the primary attack and later operative interference for chronic catarrhal cholecystitis ("strawberry gall-bladder").

Case 2. Long-continued stomach trouble intermittent in character, later constant and complicated by an acute crisis associated with chill, fever, sweat, and jaundice. Pathologically, cholelithiasis, empyema of the gall-bladder with gangrene.

Case 3. A young adult female in whom tonsillitis and abscesses about carious teeth were rapidly followed by dyspeptic and mild gall-bladder distress. Pathologically, marked cholecystitis with cholelithiasis.

Case 4. An adult male with a two-year history of intermittent "stomach trouble" of ulcer type, terminating with duodenal stenosis. Pathologically, cholecystitis, adhesions to the duodenum, protected perforation of a large gall-stone into the duodenum, and duodenal ulcer.

Case 5. A six weeks' history of dyspepsia associated with pyloric obstruction, loss of weight, cachexia, and right upper quadrant tumor. Pathologically, carcinoma of the gall-bladder, cholelithiasis, secondary involvement of the stomach and colon.

Case 6. A patient appearing with rapidly enlarging lower abdominal tumor. Pathologically, ovarian cyst and large, thick-walled gall-bladder containing many stones.

Smithies says it is common in his clinic, as probably in others, to have instances of gall-bladder disease brought for examination or treatment with diagnoses not rarely professionally given of "dyspepsia," "indigestion," "hyperchlorhydria," or "peptic ulcer." It is by no means uncommon to have these patients give histories of long-continued treatment directed toward relief of anomalies supposed to be primary in the stomach.

It has not as yet become generally disseminated knowledge that true peptic ulcer is a rare finding at laparotomy or autopsy in individuals below the age of thirty, nor has it been sufficiently emphasized that in the young especially so-called hyperchlorhydria symptoms do not mean increased acid in the stomach. Abundant evidence at hand establishes the fact that many symptoms of so-called "hyperacidity" are merely manifestations of abnormal motor activity on the part of the stomach.

The wide variation in symptomatology, etiology, and pathologic changes occurring in gall-bladder disease is abundantly emphasized by the six cases which he presents.

In the second part of his article Smithies attempts to set forth certain useful facts that become evident from an analysis of 1,000 consecutive operatively demonstrated instances of gall-bladder disease.

There were more than twice as many females as males. The average age for the series was 43.2 years. In 9 per cent reliable information respecting the appearance of malignant disease in blood relatives was obtained. It is interesting to note that there was an hereditary history of cancer in but one of the neoplastic gall-bladders of the series.

In 6.5 per cent of the cases there was a definite relationship between pregnancy or childbirth and the gall-bladder disease.

There was an operative mortality of 5.9 per cent, including all types of ailments.

The author states that a working knowledge of the nature and character of the pathologic changes occurring in the gall-bladder would appear to be essential for a proper appreciation of the clinical manifestations for which these pathologic alterations may be responsible. The basis of gall-bladder pathology is largely the reaction of four layers of tissue to infection. The infection is most commonly blood-borne. It is quite likely that bacteria first produce changes in the mucosa and submucosa. Such changes consist in congestion and infiltration of the villi with lymphocytes. *In situ* the gall-bladder, grossly, to sight or touch presents no



marked variation from the normal, and this type of gall-bladder frequently goes untreated.

The physical characteristics of the gall-bladder contents are also influenced by the nature of the inflammatory process going on in the mucosa. Persistent inflammation produces desquamation and later atrophy of the mucosa. Excessive amounts of mucus, bacteria, epithelial elements, and cholesterol are thrown off. The normal golden bile becomes turbid, thick, mucoid and often dark. If drainage remains fairly free, the altered bile may in part pass.

Stones may occur at any stage of an infected process. They may require but a few weeks for development.

As to the clinical symptomatology, pain was a characteristic symptom in 95.5 per cent of his cases. It was usually located in the right upper quadrant and varied from a feeling of fullness or distress to a real colic. Abdominal tenderness was present in 883 cases and epigastric tumor or ridge was present in 89 cases. Jaundice was present in 28.7 per cent of the cases. Vomiting was an annoying symptom in 452 cases.

In 87 consecutive cases of cholelithiasis stones were definitely demonstrated by X-ray plates in 19 cases.

The statistical tables are of great interest in connection with the article. G. W. HOCHREIN.

**Judd, E. S.: Surgery of the Gall-Bladder and the Biliary Ducts.** *J. Am. M. Ass.*, 1918, lxxi, 79.

For the purpose of reviewing the clinical features in diseases of the gall-bladder and its ducts, they have been considered in four groups.

In Group 1 are those cases of a more or less chronic cholecystitis producing dyspepsia and, at times, acting as a focus for a more or less general infection. Just what difference there is, in the pathology and bacteriology, between cholecystitis with stones and cholecystitis without stones, has not been definitely determined, although inflammation of the strawberry type may reach a very extreme degree without the formation of stone.

In Group 2 are included those patients having typical gall-stone colic.

In Group 3 are placed those cases of typical cholangitis with stones in the common duct which, at the time of the attack, produce an obstruction to the flow of bile and a resulting jaundice. The gall-bladder in these cases is frequently destroyed or nearly so, and a more complete recovery will follow its removal.

In Group 4 are the atypical cholangitis cases with painless or almost painless jaundice. It is quite impossible to make a definite diagnosis before exploration in a large percentage of these cases, and, in view of the fact that there is so much uncertainty, in all cases of painless jaundice in which a positive clinical diagnosis cannot be made, the patient should be subjected to an exploration. The symptoms may be produced by biliary cirrhosis or by malignant disease at the ampulla or at the

head of the pancreas, and sometimes this form of jaundice may be produced by an inflammation in the head of the pancreas, although this occurrence is probably quite rare.

Cases in this group are not ones in which it is especially attractive to operate, as the operation may be very difficult and the patient in none too good a condition. The greatest difficulty usually arises from oozing and hæmorrhage which may come from the wound or possibly from the mucous membrane of the nose, throat, or intestinal tract, and may begin at any time up to eight or ten days after the operation. Too much emphasis cannot be laid on the advisability of transfusing all patients with jaundice before operation. To accomplish the most good, transfusions must be made before any oozing begins. If, in spite of this procedure, oozing does start from the wound and from the mucous membranes, as it may at about the end of the first week after the operation, aspiration of the congested liver with a large trocar or even opening well into the liver substance is of great benefit.

Investigations would seem to show beyond any question that the bile flow is regulated, at least to a degree, by the gall-bladder.

The technique of operations on the gall-bladder and ducts is definitely established, though there is much variation in the operation according to the judgment and method of procedure of the individual operator. There can be no question that cholecystectomy is as safe a procedure as cholecystostomy, if the operator has had ordinary experience. The immediate convalescence is more satisfactory and the ultimate results certainly are better following cholecystectomy.

Whether the removal of the gall-bladder be done by starting at the fundus and dissecting downward or by starting at the cystic duct and freeing it first, there are two main factors which must be emphasized: (1) the cystic artery must be securely tied; (2) in order to prevent any disturbance of the common duct, it is essential that complete isolation of the cystic duct be made before clamps or ligatures are applied.

If the infection is confined to the gall-bladder, it is best to remove it, if possible. Enlargement and hardening of the head of the pancreas is an indication for removal of the gall-bladder in preference to drainage. EDWARD L. CORNELL.

**Ochsner, A. J.: Renal Calculus and Gall-Stone; Removal Through Right Lumbar Incision; Dietetic Treatment of Renal Calculi.** *Surg. Clin. Chicago*, 1918, ii, 437.

Ochsner reports a case of a woman of seventy-six who was admitted to the hospital because of an attack of pain in the right side of the back and flanks. Twenty-three years before admission she began to have attacks of pain in the right lumbar region. Six years ago a doctor took an X-ray and told her that she had a stone in the left kidney, but of late years she had had no trouble with the left side.



Following the physical examination at the hospital she had an attack of severe pain in the right side of the abdomen at a point just below the rib margin in the axillary line. Examination showed moderate tenderness without spasm on deep palpation over both flanks in the kidney regions. The X-ray picture showed a shadow about 2 cm. in its greatest diameter and  $1\frac{1}{2}$  cm. in its lesser diameter, located just beneath the margin of the last rib on the right side.

In discussing the case Ochsner says that the history of a stone in the left kidney with severe pain would indicate that on that side the patient had a small stone which had been expelled through the ureter in the meantime. The stone in the right kidney at the present time must be irregular in shape and held in one of the calices of the kidney and kept there distinctly by its form, so that it can never get into the ureter. Consequently, the ureter cannot be dilated to the extent of permitting it to pass.

The author states that if one operated for the removal of every stone that one is able to demonstrate, he would have to operate at least ten times in order to relieve the one requiring the operation. Nine out of every ten recover spontaneously. Ochsner's method of treatment is to give the patient two ounces of glycerin every night for two or three nights in one pint of sour lemonade and then give one-half pint of distilled water every hour. In a large majority of cases the stone will slip out within a week or so.

In the case under consideration, a diagnosis of gall-stones was made. At operation an oblique lumbar incision was made and the kidney brought into view. The stone was demonstrated. Sutures were placed through the substance of the kidney under the guidance of the finger in the pelvis and an incision made directly down to the stone. The stone was removed and the wound packed with gauze.

Through the same opening a pair of forceps was placed upon the cystic duct just below the point at which the stone could be felt. A second pair of forceps was placed distal to the first and the cystic duct cut between these two forceps. A pair of forceps on the side of the gall-bladder served as a retractor, by means of which the gall-bladder could be steadied while freeing it from its attachment to the liver. Gauze was then packed against the raw surface of the liver down to the point of the forceps which remained attached to the cystic duct, and either a glass, rubber, or cigarette drain was carried down to the point of the forceps which remained attached to the cystic duct. These forceps were removed in forty-eight hours. The drainage tube was left in place for about one week. The gauze packing against the surface of the liver was loosened by gentle traction on the fifth or sixth day after operation and slowly removed. The wound in the lumbar region was closed by successive layers of sutures grasping the cut ends of the muscle, the

deep fascia, and the skin, the cystic duct drain passing out through the incision in the loin.

The gall-bladder when opened showed changes in the mucous membrane, particularly in the region of the impacted cystic duct stone. The renal stone was a typical "mulberry" stone. A radiograph taken one week after operation showed no shadows.

G. W. HOCHREIN.

**Behrend, M.: Obliteration of the Common Bile-Ducts Following Operation.** *Ann. Surg.*, Phila., 1918, lxviii, 32.

The author is of the opinion that the common duct is, in all probability, injured quite often, but that the case is not usually reported by the operator who has inflicted traumatism to it.

He then reports the case of a woman, operated upon previously by another surgeon for gall-stones. She was drained for three months after a cholecystectomy, following which she felt well for two months. After that time, chills, fever, vomiting and jaundice developed; her appetite became poor; the stools were continually clay-colored; and she lost sixty pounds in weight.

At the first operation the gall-bladder, which showed many adhesions, and the appendix were removed. The common duct was probed and found patulous. At the second operation the common duct could not be found. Bile was located high up under the liver and in the region of the hepatic duct, which was greatly dilated. Upon opening the place where the needle discovered bile, Behrend was unable to pass the probe downward, but it passed in an upward direction. With difficulty a hepaticoduodenostomy was accomplished. A rubber drainage tube was placed in the anastomotic opening.

Following this operation, the patient remained jaundiced for some time and intense itching continued for weeks, even after her discharge from the hospital. The character of the stools indicated that bile must be flowing through the anastomotic opening. On the twenty-first day, another operation was performed. The anastomosis was found to be in perfect condition. A T-tube was inserted but removed after ten days.

During the past year the patient has gained over fifty pounds in weight and appears to be in the best of health.

In conclusion, the author wishes to emphasize the possibility of injury to the common duct while doing a cholecystectomy.

E. C. ROBITSHEK.

**Bevan, A. D.: The Present Status of Surgery of the Bile-Tracts; a Brief Review of the History of Bile-Tract Surgery.** *Surg., Gynec. & Obst.*, 1918, xxvii, 49.

In making a diagnosis of gall-stones, Bevan lays great stress on an accurate history. The next important factor is to exclude, if possible, other conditions, namely, duodenal ulcer simulating gall-bladder disease. The physical examination, laboratory tests, and X-ray findings are next to



be considered, in the order named. If symptoms are not too menacing, it is preferable to operate between attacks; if rupture of the gall-bladder is imminent, immediate operation is, of course, advised.

When the disease is located in the gall-bladder, cholecystectomy is done in preference to cholecystostomy. This latter operation has been practically abandoned except in cases of chronic pancreatitis or empyema, if the patient's condition does not warrant cholecystectomy. If the gall-bladder looks normal and empties easily it is not interfered with in the absence of other bile tract disease. Carcinoma in or about the bile tracts, as well as syphilis, can usually be diagnosed before operation.

The key to successful bile tract surgery is a good exposure of the tract in cholecystectomy. The cystic duct should always be clearly defined before division and ligation. The Bevan incision, commencing high up in the angle between the ensiform and costal cartilages, proceeding to the middle of the rectus, then downward to the umbilicus and ending with an outward curve of several inches, is the incision of choice. The rectus itself need usually be split merely longitudinally. LISTER TUHOLSKE.

**Kerr, A. A.: Cysts and Pseudocysts of the Pancreas; with Report of Cases.** *Surg., Gynec. & Obst.*, 1918, xxvii, 40.

The term pancreatic cyst has been used to describe any fluid tumor in or associated with that organ, though such tumors differ in etiology, position, and clinical manifestations.

Differential diagnosis must exclude: (1) malignant disease of the pancreas, or of the adjacent organs; (2) aneurism; (3) echinococcus cysts of the liver, spleen or peritoneum; (4) affections of the retroperitoneal lymphatic glands; (5) hydronephrosis or pyonephrosis; (6) cystic disease of the suprarenal capsule; (7) circumscribed peritonitis with exudation; (8) ascites; (9) cystic disease of the ovary; (10) hydrops of the gall-bladder.

Hardness and irregularities of the surface suggest malignancy. The pulsations of an aneurism and the bruit are pathognomonic. Hooklets are found in echinococcus cysts, if the tumor be not a sterile echinococcus cyst. Tenderness over the lumbar region and intermittent fever with pyuria is found in pyonephrosis.

Cystoscopy with catheterizing of the ureters affords valuable information.

The X-ray should be used as routine in the diagnosis of these tumors. Exploratory puncture is condemned.

The bronze skin and low blood-pressure suggest disease of the suprarenal capsule. The author cites a personal case of a physician who died from cancer of the suprarenal gland and stomach, as shown at autopsy.

Pancreatic cysts usually occupy the lesser peritoneal cavity or omental bursa. A case is reported of cystic disease of the ovary filling the entire abdominal cavity.

Hydrops of the gall-bladder is located more to the right side and is attached to the liver.

Pancreatic cysts may be classified as: (1) retention cysts; (2) proliferation cysts—cystic adenoma, cystic epithelioma; (3) hydatid cysts; (4) congenital cystic disease; (5) hæmorrhagic cysts; and (6) pseudocysts. The last form is not a true pathological classification but a convenient clinical term.

Vellar collected reports of 125 cases of pancreatic cysts which had been opened and drained, with 7 deaths; several patients died later from diabetes. Total extirpation had been performed in 26 cases, with two deaths.

Pancreatic enzymes are not always present in pancreatic cysts. The symptoms depend on the size and location of the tumor. A rounded fluctuating tumor in the epigastric region close to the stomach is suggestive of the pancreatic cyst. Diabetes was present in one of the author's cases.

Pancreatic cysts occur in a variety of situations.

The author's conclusions are as follows:

Pancreatic and pseudo-pancreatic cysts, while not very rare, are of sufficient importance to be recorded.

The X-ray is helpful in diagnosis.

Treatment is surgical; usually incision and drainage. Sometimes in favorable cases it is practical to remove the entire cyst.

Diabetes is an occasional complication, but if the glycosuria is below four per cent, operation is permissible after proper preliminary treatment.

Explanation of drawings illustrating the normal peritoneum, the position of the pancreas, the various positions in which pancreatic cysts are found, and the methods of operating are given.

**Riesman, D.: Chronic Septicæmic Endocarditis, with Splenomegaly Treatment by Splenectomy.** *J. Am. M. Ass.*, 1918, lxxi, 10.

Among the symptoms of malignant endocarditis one especially is important, to which but slight attention seems to have been given, namely, the enlargement of the spleen. It is practically always enlarged, and is sometimes the dominant feature in the chain of symptoms. The spleen is a filter for bacteria. The filtration causes an accumulation of bacteria in the spleen which leads to hypertrophy, a sort of work hypertrophy, as William Mayo calls it. Moreover, living bacteria are often present in old infarcts of the spleen. May not the long continued existence of bacteria in the spleen in endocarditis be the principal reason why the so-called bacteria-free cases go on to a fatal termination?

In view of the hopelessness of treatment of chronic septicæmic endocarditis and in view of the value of splenectomy in other infectious diseases, as in syphilis, malaria, and splenic anæmia, one is warranted in removing the spleen in cases of septicæmic endocarditis in which the organ is markedly enlarged. On the basis of this theory the author undertook the operation in one case, and, although the patient died one month later of an abscess of the

larynx, he so markedly improved after the operation that it is here reported in the hope that the procedure will be undertaken by others.

P. W. SWEET.

### MISCELLANEOUS

**Dercum, F. X.:** *Visceral Symptomatology in Nervous Diseases; Grave Dangers of Misinterpretation and of Unnecessary Surgical Intervention.* *J. Am. M. Ass.*, 1918, lxxi, 92.

The specialist of today, in order to avoid the danger of acquiring a narrowed horizon, should keep in touch in greater or less degree with the other departments of medicine, including neurology. Here, both in functional and organic nervous diseases, the affections may express themselves by visceral symptoms or by symptoms that simulate visceral disease. Errors in diagnosis and consequently in treatment are frequently made, and not infrequently, especially when the symptoms are referred to the abdomen, grave, unnecessary and wholly gratuitous operations are performed.

The author classifies the functional nervous affections into first, neurasthenia, the neurosis of chronic or persistent fatigue; second, psychasthenia, an affection made up of a pre-existing neuropathy plus nervous exhaustion; third, hysteria, the disease of suggestion; and last, hypochondria, in which the patient suffers from a fixed conviction of illness.

The symptoms of neurasthenia consist of motor, sensory, psychic, and somatic phenomena. In the latter phenomena there are symptoms everywhere indicating a deficient innervation and a deficient inhibition which may involve any organ or set of organs, such as the digestive or circulatory symptoms. In these cases the pain and tenderness which may be present in the abdomen is not so severe as in inflammatory conditions, ulcer, or other organic trouble. Nausea is infrequent, and vomiting quite rare. He states that it is important not to give the local symptoms a value which they do not possess and not to forget the general condition with which they may be associated.

Hysteria he describes as a neuropathy characterized by a pathologic susceptibility to suggestion. Among the visceral symptoms of hysteria are disturbances of the digestive tract, of the cardiovascular system, of the respiratory tract, and other symptoms resembling those of organic disease. It is noteworthy that in hysteria with digestive symptoms which may apparently be very serious, there is little change or impairment of nutrition. The pains of hysteria are distinguished from the pains of visceral disease by the fact that they are purely superficial, and that they commonly disappear under deep pressure. The tender areas are usually not confined to a single spot, and are found over other portions of the body. In addition, other evidences of hysteria are present, revealed particularly by the mental condition of the patient.

In psychasthenia, symptoms referable to the

viscera of such severity as to dominate the clinical picture are the exception, and when they are present, are of the same character as those observed in neurasthenia.

In hypochondria the complaints of the patient may lead to an erroneous diagnosis, and frequently unnecessary and misdirected treatment is carried out.

In the organic nervous diseases, especially in tabes, pain, vomiting, and other symptoms lead time and again to exploratory operations. Cases of brain tumors and tumors of the spinal cord are often subjected to unnecessary abdominal operations.

Dercum states in conclusion that the explanation of the visceral symptoms must be sought for in the intimate relations existing between the cerebro-spinal, the autonomic, and sympathetic nervous systems. Every case, especially of obscure pain or obscure visceral symptomatology, should be submitted to a careful neurological examination.

E. C. ROOS.

**Beal, N. H.:** *Abdominal Surgery as a Factor in the Treatment of Pulmonary Tuberculosis.* *Canad. M. Ass. J.*, 1918, viii, 617.

Pulmonary tuberculosis may be co-existent with other pathological lesions which may be remedied by surgery. These lesions may be either acute or chronic. Occasionally in acute cases where operation is imperative, the ordeal is well borne and improvement of the pulmonary condition follows the operation. The chronic cases showing abdominal pain, interference with digestion and nutrition, and hæmorrhage, when due to abdominal or pelvic lesions, are determining factors in keeping the patient below par. Removal of the abdominal lesion is often followed by marked improvement of the lung condition.

In the author's experience, the acute cases all did well. The chronic conditions are represented by two cases of cholelithiasis, four cases of chronic appendicitis, one case of gastric ulcer, one case of tuberculosis of the cæcum, two cases of tubercular peritonitis, one case of tubercular salpingitis, and two cases of uterine fibroids with hæmorrhage. The results obtained in the majority of the cases have proved the wisdom of operating. One case, diagnosed as cholecystitis but at operation found to be a tuberculous appendix, did badly, the patient eventually dying of the tuberculous condition. The case operated upon for a tubercular cæcum died two months later. The other cases have either remained stationary as to the lung condition or have shown a satisfactory improvement.

The following details for operation are carefully observed: (1) These cases should be operated upon in the institution where they are being treated for their lung condition; (2) the time of operation in chronic cases should be chosen when the side of improvement is at its height and not during one of the relapses which all such patients undergo;



the acute cases, of course, give no such choice; (3) the patient should not be purged or starved before the operation; clear broth is given at the meal before the operation and the bowels opened with a laxative only or with an enema alone; (4) ether should not

be used; nitrous oxide is the anæsthetic of choice, but if not available, chloroform, carefully administered; (5) after-treatment should consist of good nourishment, fresh air, and sunlight.

I. W. BACH.

## SURGERY OF THE EXTREMITIES

### DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS, CONDITIONS COMMONLY FOUND IN THE EXTREMITIES

**Campbell, W. C.: Heliotherapy in the Cure of Diseases of the Bones and Joints; Report of 127 Patients.** *Am. J. Surg.*, 1918, xxxii, 166.

Campbell emphasizes the value of heliotherapy as demonstrated by the work of Rollier of Loysen, Switzerland. General heliotherapy is of paramount interest at the present moment because of the number of war wounds amenable to solar treatment.

Campbell's work has been carried on at Memphis, and the results he has obtained among the tuberculous led him to extend the treatment to other affections of the bones and joints. His first case was one of apparently hopeless tuberculosis of the spine and hip-joint in an adult, and the cure was so remarkable that he instituted the solar treatment in the orthopedic department of several local hospitals.

A careful observation of the clinical course of the cases treated by this method is interesting. No material improvement is noted until pigmentation is well established, after which there is an increase in appetite, a decrease in temperature, increase in red blood-cells, hæmoglobin, and body weight. In patients with fistulæ the discharge becomes more copious and after a few days thinner, then gradually serous and scant, finally healing in from three to six months.

He has employed heliotherapy in 127 patients with infections of the bones and joints; 87 were tuberculous; 20 chronic infectious osteomyelitis, and 20 miscellaneous disorders. Of the 87 tuberculous cases, 65 were treated for a sufficiently long period to note the effect of the treatment on the local process; 28 have remained apparently cured for from one to five years; 11 improved, but discontinued treatment; 21 are now under treatment and are improved; 5 adults have died, but there have been no deaths among any of the 45 children.

Heliotherapy has been tried on 21 cases of chronic infectious osteomyelitis, following radical operation for removal of sequestra. In 8 cases insufficient time has elapsed to give results. Of the remaining 13, 12 have been apparently cured for from one to four years. In the one patient a small sinus remains after two years' treatment and may require a second operation.

Heliotherapy is far-reaching in its effects and undoubtedly will be found of great value for the cure of

various disorders elsewhere in the body, as well as in the treatment of affections of bones and joints.

G. W. HOCHREIN.

**Holt, E. Z.: Treatment of Long-Standing Suppurations in Arthritis and Osteomyelitis.** *J. M. Soc. N. J.*, 1918, xv, 149.

Combined local and constitutional treatment is essential in all cases. Constitutional treatment consists in good food, sunlight, etc. Tuberculin and vaccines are seldom of benefit. Local treatment depends on findings of frequent stereoradiographs. All foreign substances, sequestra, and scar tissue must be removed. Location of the focus of infection, obliteration of pockets, and the establishment of drainage are essential. Rest of the part by extension is necessary in the earlier stages. Dichloramine toluene at present is the best antiseptic. A few drops of a 5 per cent solution usually suffice, but they must be made to reach the focus of infection by means of a catheter, a grooved director, or other device. Dichloramine-T is usually dissolved in eucalyptus oil; it may also be used dissolved in chlorinated paraffin wax or chlorcosane.

LISTER TUHOLSKE.

**Mamourian, M.: The Part Played by the Bone Graft.** *Brit. M. J.*, 1918, ii, 79.

Bone grafting has been done for more than a century but the biology of bone and the bone graft still remains undetermined. The main views may be summarized as follows:

1. Bone is osteogenetic. The bone graft is osteogenetic and lives and grows without periosteum.
2. Fragments of bone grow better than the entire piece.
3. Periosteum acts as a limiting membrane and has no osteogenetic power.
4. The periosteum is the principal agent of growth and the bone graft can live and grow by virtue of its own periosteum.
5. The bone graft is osteoconductive.
6. Great importance may be attached to the cambium layer, endosteum, haversian canal linings, and marrow. MacEwen's three principles (the first three stated) were largely founded on one case which he had in 1882, but being without X-ray, he could not accurately follow the process of restitution. The remarkable feature of this and all bone graft cases is that although the graft is supposed to have been restored without the help of a limiting membrane, yet there was and is limitation of

size and shape of the bone. This is explained by the law of "natural adaptation" upon which all growth of bone grafts is based. Bone implanted anywhere but in a bone space always becomes absorbed. No one has ever been able to produce bone growth in a place where there has been no bone before.

The author secured and studied the complete X-ray records of cases and concludes that all the elements that enter into the constitution of bone are required for osteogenesis. The growth is from the grafted limb rather than the graft itself and all that the graft does is to supply what may be called the biochemical stimulus or irritant which has been abolished by trauma or disease, the new bone being formed from the diaphyseal ends, from periosteal and bony remains in the shaft zone, and, in the young, by epiphyseal lengthening.

The author in conclusion states that bone graft surgery is not so widely practiced as it should be. In the mutilations of war, osteomyelitis, tuberculous disease, ununited fractures, spinal caries, fractures of the spine, and in all cases necessitating excision of bone, the bone graft is an unrivaled means of repair and cure.

P. W. SWEET.

**Whitman, R.: An Analysis of the Weak Foot with Reference to Precision in the Use of Descriptive Terms in Teaching.** *Med. Rec.*, 1918, xciv, 49.

Of the 2,736 new patients who applied for treatment of weak foot at the Hospital for Ruptured and Crippled, 30 to 40 per cent presented either potential or actual disability of this character. The most direct of the predisposing causes is posture; a persistent attitude of abduction is of importance. The principle of treatment therefore must be directed to the proper readjustment of the mechanical forces which predispose to the condition. The most important indication of the potential or actual weak foot is a bulging inward so that the feet when placed side by side are in contact throughout their entire extent, or if the bulging is more pronounced, it is impossible to oppose the heels and toes simultaneously; if the heels are in contact, the toes diverge, and vice versa.

The bulging is caused by the inward and downward rotation of the astragalus upon the os calcis rolling the foot over toward the inner side, depressing relatively the arch, and since the leg, resting on the astragalus, must rotate inward with it, the line of strain is deflected from the center of the foot and falls over its inner border. Thus the most noticeable of the physical signs on inspection is the inward bulging; the most significant is the change in the rotation of the power of the fulcrum: the least important, the incidental depression of the arch.

The author accepts the term of abduction and believes it to be more preferable than either eversion and pronation, because the change in the line of strain is most noticeable when the foot bears weight and the mechanical disadvantage of such an attitude for active use is very apparent. Abduction is de-

scribed as a free lateral movement in the medio-tarsal joint.

He concludes with the following:

1. The most favorable type of weak foot is the well formed foot in which the normal relations can be easily restored.

2. The actual flat-foot can be restored with but little lateral distortion.

3. The changes of structure in accommodation to habitual deformity may have advanced so far that normal relations cannot be restored either voluntarily or by manipulation.

The treatment therefore is directed to the following: the first indication is to relieve the symptoms of strain and injury, but the final purpose is to assure the normal relation between the force and the fulcrum, as the essential preliminary for the restoration of muscular power and balance, upon which permanent cure depends.

M. A. BERNSTEIN.

**Gill, A. B.: Plastic Surgery of the Hand and the Forearm.** *Ann. Surg.*, Phila., 1918, lxxviii, 55.

Reconstructive surgery is difficult because of the complex and fine structure and function of the hand. There are certain principles which must be strictly observed. Even slight infections may destroy the finest work.

The principles of orthopedic surgery applied in the operative work and in the after-treatment will go far toward the restoration of industrial cripples to their former positions of usefulness and independence.

Eleven cases are presented to illustrate some of these methods and their results. In 7 cases a thin layer of fat from the thigh was placed around or between tendons, with 5 good functional results. One failed because of sloughing of some skin and fat implant, and one because of infection following operation. The 3 cases where no fat was used gave poor functional results. In one case which had a piece of steel removed from the common sheath of the flexor tendons, there was good return of function. Illustrations of 3 cases are shown.

CARL R. STEINKE.

## FRACTURES AND DISLOCATIONS

**Bouman, H. A. H.: A Study of the Fractures of the Lower Extremity of the Humerus.** *Surg., Gynec. & Obst.*, 1918, xxvii, 58.

The development and anatomy of the lower extremity of the humerus are discussed at length.

The fractures are divided into two classes: (1) the more frequent, comprising the supracondylar and fracture of the external condyle; and (2) the less frequent, consisting of fractures of the inner condyle and the two intracapsular fractures (through the condyles below the epicondyles and a partial fracture of the capitellum). Each type of fracture is discussed as to definition and description, mode of fracture, symptoms, treatment, and differential diagnosis. Roentgen rays should be used as in-



frequently as practicable, with the exposure time short because of the effect upon growing bone.

The true intracapsular fracture (Kocher's *fractura diachondylica*) has not been seen later than the fourth year. The history of how the accident occurred is important in diagnosis. Illustrations of the various types of fracture are given. To condense the differential diagnosis, a large table is shown to compare the fractures as to age, history, inspection, functional tests, and palpation.

CARL R. STEINKE.

**Williams, O. H.:** *The Early and Effective Reduction and Fixation of Gunshot Fractures of the Femur.* *Brit. M. J.*, 1918, i, 639.

From the casualty clearing station to the base hospital there is every facility for the application of the Thomas splint, but in front of the casualty clearing station these facilities are lacking and the full value of the splint has not been obtained owing to the difficulty of applying simple and efficient first aid extension.

The ideal method of procedure would be to employ so simple a method of extension that it can be applied at the spot where the casualty occurs; and which at the same time is easy and rapid of application, efficient, and need not be changed until the patient is on the operating table at the casualty clearing station.

A fractured femur, of all injuries, is the one that presents most difficulty in transport, unless some effectual measures are taken with this object in view. From the point of view of mortality, it should be placed in the same category of urgency as a brain injury or perforating abdominal wound.

The author describes a brace which is simple, effective, easy of application, and provides extension.

The brace, which is intended for application over the boot, is made of strong webbing in the form of two Y's, one of which lies on each side of the boot. The diverging limbs of the Y's merge into each other so as to form an anterior or dorsal strap in front of the ankle, and a posterior heel strap behind the ankle. On one side they are fastened together by means of a stud. The stem of each Y forms a loop to which strong cloth strapping is stitched.

The brace allows of strong and efficient extension with minimum discomfort, and there is no possibility of its coming off. There is no constriction of the ankle or pressure on the malleoli. The foot is maintained at right angles to the leg and the limb cannot roll. It can be put on in two seconds and when not in use it can be compactly and securely fixed to the splint and so be always available.

The slings are made of strong calico bandage and five are required for each splint, each being 4 inches wide and 40 inches long. Each piece is doubled on itself and the loop so formed fixed to the inner bar of the Thomas splint by safety pins or stitching. The free ends are split into tails of equal width for a

distance of about 10 inches and serve for tying to the outer bar. Three of the slings are supporting and are placed under the ankle, knee and thigh respectively; two are fixing and are placed one above and one below the knee.

When the splint is about to be applied the brace is taken off, the slings unrolled and left to hang by the inner bar. One stretcher bearer applies the brace over the boot and with it extends and rotates the limb into correct position and maintains extension by steady traction while another stretcher bearer passes the splint over the brace and boot. When the ring of the splint is well up in the groin, the extension straps of the brace are tied to the foot of the splint; the supporting slings and fixing slings are then tied. Except in severe hæmorrhage the splint should be applied first and the dressing done last. With such a splint the patient can be transported in comparative comfort.

These splints should be taken to the front line and at least one should be kept in each stretcher bearer's dugout.

V. C. HUNT.

**Schaeffer, C. D.:** *Treatment of Fracture of the Patella.* *Penn. M. J.*, 1918, xxi, 558.

The handling of these cases resolves itself into operative and non-operative treatment. Non-operative procedures are followed by fibrous union with a tendency to fragment separation. Patients with this kind of union complain much more of weakness in the leg after recovery than those who have osseous union. A useful limb can be obtained with non-operative methods but is seldom as perfect and useful as with operative methods.

Non-operative methods cannot meet the following pathological conditions: the tilting of the fragments; hæmorrhage into the joint; inversion over the fragments of the periosteum and the prepatellar tissues; lateral laceration of the aponeurosis. Operative procedures are contra-indicated in fracture of the patella in diabetic patients; advanced tubercular, cardiac, renal, and hepatic diseases; in fracture without laceration or tearing of the prepatellar tissues.

The author injects 10 ccm. of formalin and glycerine solution immediately after fracture. The operation is then done five to seven days after the injection. Absorbable sutures are used; a circumferential suture around the fragments; the prepatellar tissues and capsular ligament sutured, after which the circumferential suture is tied, bringing together firmly the bony parts of the fragments so essential in obtaining osseous union.

The joint is closed without drainage and kept quiet for ten days; then passive motion is established and massage of the quadriceps extensor muscle and the tissues below the knee is begun, but the tissues over the joint are untouched. On the fourteenth day after the operation the limb is flexed from five to ten degrees. Fixation of the joint is continued for three weeks, when the splint is removed and the patient allowed to move and bend



the joint. In another week osseous union is complete and the function of the joint fairly well restored.

E. B. FREILICH.

**Gazzotti, G.: The Influence of Hæmatoma in the Recovery of Fractures** (Contributo allo studio sull'influenza dell'ematoma nella guarigione delle fratture). *Policlin.*, Roma, 1918, xxv, sez. chir., 129.

In the Institute of Traumatology and Orthopedics of the Royal University of Rome the author made a number of animal experiments following the work already done by Bier, Bergel, and others, to endeavor to find what influence the presence of blood or a hæmatoma has in the formation of new bone and the union of fractures. The conditions of a fracture focus treated surgically differ from those of a closed fracture left to itself. In the former a free blood flow and the resulting deposition of fibrin is prevented by surgical hæmostasis, etc. It was therefore necessary for the author to make a series of animal experiments to study fractured bones with hæmatoma in the area of bone fracture without a shedding of blood.

Guinea pigs were used. Free transplants of fractured bones were made. In order to obtain transplants in which there was no blood flow, the fractures were made in animals already dead and the bone then transplanted. The transplants were made under most rigorous asepsis.

The microscopic findings in the area of fracture as transplanted show: (a) In transplants of bone fractured before the death of the animal, specimens removed after six to nine days show only slight development of connective tissue where the bone was interrupted. After twelve to eighteen days the formation of a bony and osteoid callus is abundant. (b) In specimens of fractures made after the death of the animal, only in one case after eighteen days formation of callus in the fracture was found. The results for these free homografts show:

1. Proliferative neoformative activity of periosteum is greater the more the periosteum is in direct contact with the tissues of the host. The greatest activity of periosteal elements is constantly seen extrinsic to the spots where the periosteum was denuded of its soft adhering parts, and the least proliferation where the periosteum was covered with muscle. The bony neoformation proceeding from the periosteal elements reaches a maximum in about three weeks, then there is a retrogressive period distinguished by cellular necrobiosis and absorption of the fundamental substance.

2. The compact substance of the graft rapidly undergoes retrogressive changes. Necrobiosis is observed on the sixth day after the graft, much more pronounced by the twelfth and fifteenth day; and by the twenty-seventh to the thirtieth day the death of the bone-cells of the graft is almost complete. Similar regressive changes are observed in the cartilage and medulla.

In considering what may be deduced from his experiments with regard to the influence of hæma-

toma in the formation of callus, the author observes that experimental and control findings show that in bone transplanted after fracture *in vivo* there is greater frequency of new bone callus than in transplants of postmortem fractured bone. He thinks that he is justified in concluding that the greater periosteal activity met with in the experiments may in all probability be attributed to the presence of hæmatoma at the seat of fracture.

W. A. BRENNAN.

**Clark, W. A.: Prevention and Treatment of Delayed and Faulty Union of Fractures.** *Mil. Surgeon*, 1918, xliii, 1.

The author states that if it were possible to treat all fractures under ideal conditions, there would be no need to discuss delayed union, for such a result would not be found. His observations are based upon five months' service in the Belgian Red Cross Hospital at La Panne. The difference in the treatment of fractures in military and in civil practice is the frequency of association in the former with infection.

He quotes Jones who says that there is no such thing as non-union aside from syphilitic disease; there is, however, delayed union. He gives Stimson's table setting forth the period of time necessary for union of various fractures. This is as follows: shaft of humerus, 14 weeks; head and neck of humerus, 11.5 weeks; humerus and condyles, 9 weeks; both bones of forearm, 10.8 weeks; femur (all sites), 7.37 months; leg, 4.75 months.

Added causes in delayed union aside from syphilis are scurvy, malposition, interposition of the soft parts, infection, and interference in circulation, loss of substance, either from primary trauma by shell fragments or from operative procedures, necrosis of poorly nourished fragments, and the destruction of nerve supply.

In splintered fractures those fragments which have a periosteal and muscular covering should not be removed and Jones advises the replacement of loose fragments after they have been taken out and washed.

Plates are another cause for delayed union and the author discourages the use of all metal materials in fractured bones. Adequate immobilization is of prime importance; a fractured bone he claims will unite in spite of motion; the union however will be angulated or in an abnormal rotation. The position in which immobilization is maintained is of more importance than the immobilization itself. The fixation of joints above and below the fracture is not always necessary and often gives rise to discomfort to the patient. The suspension scheme of Blake, which permits motion of all joints yet keeping the muscle pull neutralized, prevents malposition of the fragments. He gives briefly the position assumed by the fractured ends as a result of muscular insertion and pull and emphasizes the importance of such knowledge.

Roentgenograms in two planes will enable one to



visualize the position of the fractured bones and are a great aid. The distal fragment is the one easily controlled and is the one to be brought in line with the other. In some cases the distal fragment is too short to handle, as for example a supracondylar fracture of the humerus or femur. In this condition the joint is placed in a position most favorable to restoration of the fragments to place.

The problem of traction must be met promptly. Every hour that an overriding is allowed to persist multiplies the difficulty in overcoming it. A delay in union is easily recognized early by X-ray. The periosteal callus throws a shadow about the tenth day; if at the end of three weeks no shadow is cast, a delay in union is expected. Often strong fibrous tissue will form holding the fragments together. Early motion will stimulate osteogenesis. When all means fail to bring about union, open operation should be resorted to. The intramedullary autogenous graft or the cortical graft of Albee is recommended. The author emphasizes the occurrence of shock in old standing malunited femur, as the force necessary to overcome contraction of the soft parts is great and is associated with dangers. When union has occurred and the limb found to be much shorter than the healthy one, he recommends shortening the healthy one. Delayed union occurs more frequently in the upper extremities because patients make no effort to use the arm.

The author submits a few interesting photographs of specimens from the Army Medical Museum.

M. A. BERNSTEIN.

### SURGERY OF THE BONES, JOINTS, ETC.

**Bucholz, C. H.:** Arthrodesis of the Shoulder-Joint. *Am. J. Orthop. Surg.*, 1918, xvi, 364.

Paralysis of the abductor muscles of the shoulder produces a lack of stability of the joint, and deprives the shoulder of abduction, forward and backward elevation, and nearly always, rotation. In time, as the muscles and capsule become stretched, an actual flail joint results.

Arthrodesis of the shoulder is indicated in cases of complete flaccid paralysis of the deltoid and supraspinatus muscles, provided the other scapular muscles are strong enough to raise the scapula and arm. The function of the elbow, hand, and fingers should not be seriously involved, else the total functional result cannot be expected to be good.

The anterior incision through skin, deltoid, and capsule gives the easiest access to the joint, according to most authors. After the joint is opened, the cartilage is thoroughly removed from the head and socket, and the surface of the bones roughened with a chisel. Some authors emphasize the importance of exposing and scraping the lower surface of the acromion. Bucholz thinks that both a bone peg and two wire sutures through the glenoid process and the head of the humerus and between the acromion and the head should be employed to obtain fixation. He advises the immobilization of the arm with the

humerus in a horizontal direction, the elbow about twenty-five degrees forward to the frontal plane, and the forearm about thirty-five or forty degrees inclined upward. As soon as the bones are firmly united, exercise should be started and should at first be done in small angles only, bringing the elbow down step by step. A wire splint should be worn for support.

Bucholz has made a thorough review of the literature and reports the end-results of arthrodesis and other methods for repair of the paralyzed shoulder, such as the transplanting of muscles and tendons, osteotomy, nerve transplantation, and simple suspension of the humerus with silk ligaments, followed by long-continued mobilization of the arm in the abducted position. He quotes the results obtained by these various methods.

He concludes by advising a prolonged conservative treatment by support and muscle training for abductive paralysis of the shoulder. Where all hope of the spontaneous recovery vanishes, he advises, first, a nerve or muscle transplantation, provided the anatomical and social conditions are favorable. If these methods fail to produce proper results or if old and neglected cases turn up, arthrodesis is the operation of choice, provided the trapezius, serratus anterior and pectoralis are intact. If these muscles are weak, it may be well to see if they can be sufficiently trained by exercise. There is no doubt that when the proper indication is present and correct technique is used, bony ankylosis will almost certainly take place following arthrodesis, giving the arm the much-needed stability and furnishing a very useful amount of motion.

E. C. Roos.

**Gaenslen, F. J.:** Bone Grafting in the Treatment of Fractures. *Wisconsin M. J.*, 1918, xvii, 15.

In a general way, in fresh fractures of the long bones operative interference should not be considered unless several attempts to secure and maintain accurate apposition have failed. In certain instances, of course, the anatomical condition of the fracture is such that it is evident from the start that conservative methods will prove futile. Robert Jones on the basis of very large experience states that the only fracture of long bones regularly presenting almost insuperable difficulties to satisfactory reduction is the spiral fracture of both bones of the leg, especially in the lower third. The difficulty, he continues, is not in reducing the fracture but in holding the fragments in proper position.

Among the various fixation methods, the bone graft seems destined to occupy a prominent and permanent place and the sliding inlay graft after the method of Albee serves the purpose especially well. The essential point is that graft cut from one fragment is slid across the fracture site, engaging in a corresponding slot cut in the opposite fragment. Mechanically, every indication is fulfilled. Exact apposition is readily obtained and maintained with greater security with a graft than with metal bands, plates, or screws.



Magnuson has carried out the same principle using thin sterilized bone plates and securing them with specially prepared bone screws. The bone plates are very thin and yet sufficiently strong to maintain accurate reduction. They are absorbed in time and replaced by living bone.

The intramedullary graft in which a bone-splinter or an especially prepared graft is thrust into the narrow cavity of either end would serve frequently in fresh fractures to maintain reduction, but the condition thus produced is far from ideal. While in the inlay method corresponding tissues, periosteum, compact bone, endosteum, and marrow are placed in apposition, this very desirable relationship does not obtain with the intramedullary graft.

The various metal bands are applied easily and quickly, and apparently hold this type of fracture more securely than either wires or plates. In cases in which involvement of a nerve trunk, laceration of large vessels, or interposition of soft parts constitutes the reason for operative interference, the metal plate or band will often suffice, and the bone graft method, while perhaps more ideal, does not offer sufficient advantages from the practical standpoint to counterbalance the added technical difficulties. Metal appliances, after all, are foreign bodies and they are a distinct hindrance to osteogenesis. Practically every radiograph of a plated fracture will show areas of rarefaction and osteoporosis about the screws.

In cases of non-union, especially where there is marked eburnation, with a subsequent reduction in the osteogenetic power of the bone ends, the sliding bone graft or tibial transplant cut long enough to reach well beyond the area of eburnation, in contact with normal bone above and below, and bridging the gap left after the removal of the sclerosed fracture ends, solves the problem as nothing else will. Besides offering greater chances for union than any other method, there is also little or no sacrifice of length. The intramedullary graft for obvious reasons is not practical here. It is needless to say that the most rigid asepsis is necessary, while absolute immobilization is a prime requisite for the early establishment of blood supply for the nourishment of the graft.

In malunion requiring correction, simple osteotomy and treatment as for simple fracture will often suffice. If some form of internal fixation is necessary, the advantage would again lie with the graft, rather than with the metal appliances. As regards the treatment of infected compound fractures, undoubtedly bolder attempts will be made in the future in the grafting of the ununited infected compound fractures, since the Carrel-Dakin method has given more perfect control of wound healing.

J. J. KURLANDER.

**Gallie, W. E.: The Use of Boiled Bone in Operative Surgery.** *Am. J. Orthop. Surg.*, 1918, xvi, 373.

It has been pointed out by the author that when good bony contact is provided for a transplant, the

changes which occur in and around the graft are much the same whether the graft be autogenous, heterogenous, or boiled. He experimented with dogs, plating and screwing fractures of the long bones with boiled bone. It was found that the circulation was completely re-established in the boiled bone after eight weeks, and strong trabeculae of new bone had formed. In eight months no evidence of the presence of the plate or screws could be found except a moderate thickening of the shaft of the bone.

In the operative treatment of fractures, boiled bone has a decided advantage over metal plates and screws, in that it unites solidly to the fragments, never becoming loose in the tissues, and in that it is ultimately absorbed. While it is more difficult to apply plates and screws of bone than to use the ordinary Lane technique, most of the difficulties have been eliminated by the use of special instruments. In a series of sixty operations, primary union and anatomical and physiological cure were obtained in all cases. Long boiled bone screws are now being used in fractures of the patella, olecranon, neck of the femur, and oblique fractures of the long bones.

Before attempting to use boiled bone clinically to replace the autogenous spinal graft, experiments were performed on animals showing that the graft does unite solidly to the spine, and that after a period of a few weeks the graft acts as an efficient spinal support. Four cases were operated upon and one of these afforded an opportunity to study all the changes which may take place in a boiled spinal graft. These consist of the union of the graft to the spines by the laying down of new cancellous bone upon it; the re-establishment of the circulation by the ingrowth of blood-vessels into the empty haversian canals; and finally the invasion of the graft by osteoblasts along the course of the blood-vessels. The ability of these osteoblasts to spread along a dead graft for an interval as far as half the distance between the spines, was conclusively demonstrated.

From the animal experimentation it was demonstrated that the rapidity of union of boiled bone to living bone with which it is in contact, and the rate at which it is absorbed and replaced, depend very largely on the density of the bone used. It would therefore appear desirable to use bone in these operations which is as porous as the required strength will allow.

Remembering that the graft is dead and must depend for its osteoblasts upon the neighboring living bone, perfect contact with the living bone must be provided. This makes the careful preparation of the bone beforehand necessary, so that its curve and angle will fit the kyphosis. It should be just long enough so that each end is buried in one of the spines. The largest raw surface in the living bone is provided by the spine-splitting operation. The part of the graft coming in contact with the living bone should be of the cancellous type. Beef ribs, split green, make excellent grafts.

E. C. ROOS.



**Gallie, W. E., and Robertson, D. E.: The Transplantation of Bone.** *J. Am. M. Ass.*, 1918, lxx, 1134.

Attention is drawn to the principles that should govern the science of bone grafting. It must be remembered that a so-called living autogenous bone graft is alive only by virtue of the osteoblasts that are free on its surfaces and in the mouths of the haversian canals. All the rest of the graft dies and is absorbed. It owes its value in bridging gaps and in encouraging union of ununited fractures to the fact that during the process of its absorption the osteoblasts which invade it from its own surfaces and from the neighboring bones build up new bone to take the place of that which is absorbed, so that ultimately the break in the continuity of the injured bone is bridged by new and healthy bone.

This established fact indicates at once the necessity for perfect contact of the graft to fresh, healthy bone in the fragments and shows the reason for extending the graft well beyond the sclerosed extremities. It also shows the importance of using as a graft bone from which the periosteal and endosteal surfaces have not been removed, as it is on these surfaces that the greatest number of osteoblasts is to be found.

For the same reason the graft should be made from bone which is as porous as the requirements of the case, in relation to strength, will allow. Hence the value of the rib as a graft, particularly if it has been opened up so that the osteoblasts of the interior can obtain the necessary supply of lymph.

After the principal graft has been inserted, as many small pieces as possible should be packed around it, the fragmentation increasing the surface area exposed and hence increasing the number of surviving osteoblasts.

In those cases in which the introduction of living osteoblasts is not an essential feature of the operation, the value of boiled bone must not be overlooked, as it possesses many of the virtues of the autogenous graft without some of its disadvantages.

EDWARD L. CORNELL.

**Deavor, T. L.: Some Points of Interest in Bone Surgery, with Special Reference to Union Work.** *Am. J. Surg.*, 1918, xxxii, 161.

Deavor reviews the early history of bone surgery, calling attention to the use of Lane plates and other mechanical devices, autogenous bone grafts, pegs, and inlays. He dwells on the necessity of perfect asepsis in doing bone work, and the importance of carefully watching the patient after operation. He says that much skilful work has resulted disastrously, because during the final days of the treatment the surgeon failed to estimate the value of personal supervision, and the rigid application of undesirable detail.

He deals particularly with the treatment of union. His technique is as follows:

A linear-shaped skin flap, rounded in front, with base posterior, is first turned back, beginning slightly

beyond the line of articulation. Next, an area of subcutaneous tissue, similar in shape, with base anterior, and large enough to fully line the proposed joint, is carefully carved out, so as to avoid the underlying structures. On reaching the joint it is desirable to leave a collar of fascia, extending around the exposed inner portion of the neck of the metatarsal bone. The joint is then opened and a part of the head of the bone removed with a Gigli saw. The reamer is then applied at various angles until all superfluous bone is removed, smoothing and rounding the head back to the ring of fascia previously referred to. The depression in the base of the phalanx may sometimes need to be deepened to receive the newly formed head. At this juncture the subcutaneous flap is carried into the joint and fixed with fine catgut, so that the bony surfaces will always remain effectually separated from each other. The collar of fascia is now stitched under considerable tension to the interarticular structure along the line at which it curves to enter the joint cavity. The wound is closed without drainage.

After the third day gentle passive motion is begun and continued daily until healing is completed and satisfactory. The patient may be up in ten days, wear a soft shoe four days later, and resume her usual activities in five or six weeks. Not until several months have elapsed will the entire foot come into possession of its former elasticity.

G. W. HOCHREIN.

**Doerge, K.: Advantages and Disadvantages in the Use of Metallic Bone Plates for Fractures.** *Wisconsin M. J.*, 1918, xvii, 10.

Merely exact and firm union of broken bones constitutes but one of the elements of the treatment of fractures. Attention should also be given to the other injured tissues such as muscles, nerves, etc. It is evident that the first object in treating a fracture is to put the fractured ends into their former positions as accurately as possible. The greater the accuracy with which this is accomplished, the more certain will nerves, vessels, muscles, etc., return to their proper position and function. If the fragments are fractured squarely or serrated, it very seldom displaces after reduction. But where it is spiral, very firm bandaging is necessary to keep the fracture from redisplacing. This may result in an injury to the muscle such as ischæmic contracture. The greater the displacement or vicious union, the poorer the result will be as regards muscle function. Therefore, the two main essentials of the proper treatment of fractures are, first, the accurate reduction and alignment of the bones; and second, the proper treatment of the soft parts by massage and passive and active motion.

The X-ray is of the greatest aid in reduction, but is occasionally misleading, especially when the bone is severely splintered. It may turn out in the future that the greatest benefit derived from the use of the bone plate is not so much the plate itself but the open visual reduction of the fragments



which is thus accomplished. Exact reduction eliminates subsequent pain, it shortens the period of disability, it permits bony union by firm retention, it avoids the formation of excessive callus, and gives the muscles and soft tissues the best advantage to resume their normal function early.

It may be said that absolute reduction can only be accomplished by the open method. This, together with its continued retention, is especially well met by the application of the bone plate. It is after the bone has united and after further necessity for a support by a splint becomes unnecessary, that the use and the advantages of the Lane plate have been seriously questioned. Its utility being passed, much depends upon its subsequent behavior in the tissues. It is proven that the aseptic bone plate implanted into aseptic tissues and not subjected to constant irritation will remain indefinitely without harm; but if exposed to repeated irritation, will be a source of more or less pain and disturbance. A plate imbedded under other than strictly aseptic conditions must necessarily lead to infection, with discharging sinuses and possible disaster.

The Lane plate is used to its best advantage in the fracture of the shaft of the long bones, the best example of which is the femur. No matter whether the break is simple or comminuted, it can always be spanned over by a bone plate, or by several if need be. After the fragments are reduced and the plate firmly attached, it is covered deeply by the fibers of the quadriceps muscle. The foreign material becomes encapsulated and the patient wears the plate to his entire forgetfulness. Lane considers it unnecessary and undesirable to apply any further support in the shape of cast or splint for safe retention. The slight amount of motion it does permit serves as a stimulant to bony growth and promotes firm healing.

Whenever the author applies a Lane plate, he does so in such a manner as to be easily removed if subsequently necessary. Occasionally delayed or even non-union has been observed after the use of the bone plate, and if it were caused by this device, would form a serious disadvantage. However, non-union is a possibility occurring in all open methods of treatment, as it has been reported following the use of the bone graft, and also following open reduction where no support of any kind was inserted. The slight disadvantage that the removal of the plate constitutes is fully compensated and outweighed by the benefits derived because of the accurate reduction, safe retention, and ability to properly treat the soft tissues.

The author's opinion as to the indications for bone plating is as follows:

1. All simple fractures that cannot be accurately reduced by manipulation are properly adjusted by operation.

2. All simple fractures that are readily reduced by manipulation but show a distinct tendency to redisplacement are treated by the open method of reduction.

3. If after correct open reduction, the fragments tend to remain in apposition, no plate or other support is inserted and the wound is closed and the external splints applied.

4. Only those fractures which have been reduced by the open method and show a tendency to redisplacement are immediately plated.

5. The routine removal of the plate is advised in all cases where there is irritation or where the plate may act as an irritant to joints, tendons, or nerves.

In infected fractures it is advisable to allow the infection to subside and the wound to heal up before an attempt is made at plating.

J. J. KURLANDER.

**Mosti, R.: Osteosynthesis in War Surgery** (L'osteosintesi in chirurgia di guerra). *Clin. chir.*, Milano, 1917, xxv, 94.

Since the beginning of the war Mosti has treated 15 infected compound fractures by osteosynthesis. He gives short clinical histories of these cases. He thinks the opinion of many surgeons that in infected war fractures osteosynthesis is absolutely contra-indicated is unjustifiable. Mosti thinks, on the contrary, that it is one of the most useful methods available for treatment of certain fractures, judged by the final results.

The fractures treated were distributed as follows: mandible, 2; humerus, 2; radius, 1; radius and ulna, 1; femur, 2; patella, 1; tibia, 4. All were septic wounds. In the great majority of the cases the fracture was comminuted and multiple, only 3 cases being simple, regular fractures. Although in some cases the operation was done when the general and local conditions were extremely grave, yet all recovered, which shows that in war fractures osteosynthesis is a relatively benign operation. In no case was a subsequent amputation necessary. The good results are not alone due to the metallic immobilization of the fractured limb, but also to the early surgical cleansing of the tract and its continuous irrigation with chlorosol. Although in most of the cases the functional result is incomplete, this perhaps may be remedied by physiotherapy. However, the author thinks that the functional results would not have been nearly so good had osteosynthesis not been used.

All of his cases have given the author the clearest demonstration that metallic osteosynthesis of infected fractures is not a cause of persistence and recrudescence of infection. After a few days the temperature, previously high, becomes normal or nearly so, oedema and inflammatory infiltration of the tissues disappear, and suppuration is notably reduced. The reason for this is to be found in the perfect immobilization of the fragments by the metallic fixation, and in the absence of secondary displacements.

In 7 of the author's cases bronze-aluminum wire was used; in 3 cases Dujarier's clips; in 2 cases silver wire; in 2 cases iron wire; and Lambotte's plates in 1 case. The silver wire was used in the



mandibular fractures. By adopting wire the fixation can be made either by suture or ligature, according to the form and disposition of the fragments. Tube-drains are used, contra-apertures for this purpose being made at the lowest possible point.

The period at which the material used for the osteosynthesis ought to be removed varies according to the case. It will depend on the clinical and radioscopic findings confirming consolidation, and no true limit can be fixed.

From Mosti's experience it appears that osteosynthesis is indicated in war fractures under the following conditions: (1) in fractures with great displacement of the fragments; (2) in fractures, retention of the fragments of which is difficult; (3) in fractures with extensive loss of substance or with very numerous fragments. W. A. BRENNAN.

**Villard: Astragalectomy in Foot Deformities; Talipes Equinus Following War Wounds** (De l'astragalectomie dans les pieds bots; varus équin consécutif aux blessures de guerre). *Lyon méd.*, 1918, cxxvii, 176.

Deformities of the foot consecutive to war wounds are very frequent and among these talipes varus is most characteristic. This may follow superficial injuries, ligamentous avulsion, tibiotarsal fractures, or muscle injuries of the leg or thigh. Whatever the origin, there are two principal deformities: extension of the foot on the leg, and rotation of the plantar surface inward, so that the man walks on the metatarsal and external edge of the foot; in extreme cases the dorsal edge of the foot comes in contact with the ground.

The treatment of these war deformities is very delicate and varies greatly according to the case. Some merely require dressing in a good position; but in such cases there is always a tendency to a recurrence and a condition of permanent equinism. Astragalectomy has always seemed to Villard to be indicated in severe cases, and to be superior to tenotomy or arthrodesis. Tenotomy is insufficient because it only corrects the equinus without modifying the varus. Arthrodesis does not modify the equinism. But astragalectomy attacks both the varus and equinus.

The author prefers Ollier's technique in astragalectomy. After removal of the astragalus the cavity is dried, the edges of the capsular incision united by catgut sutures and closure of the wound done with silk gut. The foot is dressed, immobilized in good position in plaster, and left without changing the dressings for thirty days. The author thinks that this complete closure without drainage is the treatment of choice, that filling the cavity left by the removal of the astragalus is not only useless but dangerous as it may become the source of a fistula.

The plaster cast is removed on the thirtieth day, and then according to the findings immobilization is continued or mobilization is begun. By the fiftieth day a provisional walking apparatus

can be applied, which is later replaced by an orthopedic shoe.

The author has operated upon 6 very severe cases of equinovarus following war injury and all the patients have recovered with normal re-establishment of plantar support. The foot is mobile, without lateral movements, and pressure on the ground is correct. W. A. BRENNAN.

**Speed, K.: Base Hospital Amputations in War.** *J. Am. M. Ass.*, 1918, lxxi, 271.

Base hospital amputations may be roughly divided into two classes: first, those that are indicated on the arrival of the wounded from the clearing stations; and, second, those required much later. In the first class may be included the early gas infections, fulminating sepsis of large joints and bone injuries, and those wounds which have been passed through clearing stations in rush periods without receiving surgical attention, their primary need being amputation. In the second group might be placed the secondary hæmorrhage from extremity injuries, septic limbs with or without gunshot fractures, septic joints, late gangrene from primary vessel injury, and trench foot. In the face of tetanus no operating is done.

More patients suffer from delayed acceptance of the indication of amputation, thus failing to survive the operation, than are mutilated by early amputation or operation before a rigid indication. That point is strongly brought to mind by patients suffering from septic large joints, such as the knee, many of whom might be saved if an early amputation were performed. Removal of a limb is preferable to losing the patient. The sepsis of war wounds is so insidious when once under way that the period beyond which operation is ineffective may be passed unnoticed. Hence the advice is given to make the indication rigid, but to amputate early.

The total number of amputations reviewed was 121, following which there were 35 deaths, a mortality of 29 per cent. The total number of gas infections handled among amputated patients was 27, with 12 deaths and 15 recoveries.

EDWARD L. CORNELL.

**Defosses, P.: Amputation Stumps** (Soins à donner aux moignons). *Presse méd.*, Par., 1918, xxvi, 290.

Defosses refers to the orthopedic care which is necessary to complete the work of the surgeon and to make an amputation stump fit to carry a prosthetic apparatus.

Before cicatrization it is necessary to place the stump in such a position that ankylosis of a joint may not occur, or if ankylosis of a joint should occur, the stump can still be fully useful.

It is an error to think that rest in bed or ambulation by aid of crutches is necessary for good cicatrization. Provisional apparatus can be used, supported at other points than the stump, and the patient can get about using a cane only.



A good deal of the subsequent defective cicatricial results are due to suppuration. Frequent radiographic examination during the postoperative period will detect foreign bodies, bone sequestra, etc., and obviate suppuration by indicating the appropriate treatment.

After cicatrization, even though perfect, the stump may be painful or unfit for use. To render a stump fit for its apparatus, some or all of the following points may be necessary: (1) making the skin of the stump supple by lavages, hot water or hot air baths, alcohol rub, etc.; (2) restoring the tonicity of the muscles by massage and electrical treatment; (3) preserving the mobility of the adjacent articulations, either by passive or active manual or mechanical mobilization or similar measures; (4) giving the stump its definite form by compression or by a temporary apparatus.

Where there is a defect in the stump which cannot be removed by any of these measures, operation or reamputation may be indicated.

The author finally describes the details of the application of temporary prosthetic appliances as carried out at the Belgian ambulance "L'Océan" at La Panne in the case of a thigh amputation.

W. A. BRENNAN.

### ORTHOPEDICS IN GENERAL

**Putti, V.: The Utilization of the Muscles of a Stump to Actuate Artificial Limbs; Cinematic Amputations.** *Brit. M. J.*, 1918, i, 635.

The possibility of utilizing the functional resources of the stump so as to convey movement to the artificial limb was an idea that came to Vanghetti first in 1896. From that time on he wrote articles in which he developed his theory of what he had named "cinematic amputation." Prior to the war the number of cinematic amputations did not number more than twenty.

Vanghetti has given the name "cinematic plastics" or "cinematics" to any kind of bloodless or operative plastics that tend to economize, restore, or substitute those muscular masses that can be employed to impart direct or voluntary movement to an artificial limb. Every moving entity obtained cineplastically, whether bloodlessly or operatively, is called a "plastic motor."

Plastic motors are based on the following general principles: In an amputation or disarticulation, actual or antecedent, the tendon and muscles, provided they have the necessary physiological protection, skin, vessels, nerves, etc., can generally be used in cinematic prosthesis, on condition that the formation of an artificial point of attachment, to be protected in a similar manner, is available. Cinematization can be effected or prepared at the time that the primary amputation is done; it can also be done on stumps that have already healed. Plastic motors may vary as to their number, position, shape, and function. At the present day the most elementary and commonly used are the clava

(peg) and ansa (loop) motors, and those obtained by canalizing or tunnelling of the muscular masses.

The motor may be single, double, or multiple. In function it can be either unimotor or plurimotor. When the motor is made to execute two opposite movements in succession, it is called alternative. Motors are either terminal, when placed at the extremity of the stump, or extraterminal, should they be placed in the continuity of the stump. Down to the present time the upper limb has been more frequently cinematized than the lower.

In cases where it is practically impossible to perform primary cinematic plastic operations, as at the first aid dressing stations in the full stress of battle, the surgeon can always so operate as to prepare the ground for a future cinematization of the stump. Skin flaps, muscular insertions, various bone and tendon fragments and segments of limb, which would seem superfluous under ordinary circumstances for the preparation of ordinary stumps, must be recognized to be of the greatest value in view of future cineplastics. A plastic motor must possess every requisite for withstanding a firm, resisting, and painless grip, and also a traction force that may be high; it must be provided with a sufficient amount of muscle masses capable of functional movements to guarantee the accomplishment of the task that will be demanded. The motors must be covered with skin in perfect condition; well nourished and possessing a normal degree of sensibility. The motor must be of a size suitable for fastening of hooks, rings, and rods that are to transmit the functional movements to the artificial limb.

As the tendon is the element best adapted for the transmission of muscular contractions, it should be largely employed for the formation of motors. Should the tendon be missing, the muscles must be utilized.

In order to provide such materials as may be missing, recourse may be had to the methods that plastic surgery places at disposal, such as skin, muscular, aponeurotic, or osseous transplantations. Arthroplasties may be utilized to render mobile those stump segments which through stiffness or ankylosis have become unusable. The cinematization of the thigh stump enables one to gain active power over the knee-joint.

As a result of cineplastics it is now possible to utilize certain stumps which hitherto were held incapable of functional movement, as carpal stumps, very short stumps, and disarticulation stumps. With regard to the short forearm or short leg stumps cineplastics is greatly facilitated through the preparation of points of attachment that correspond to the insertion of the biceps and patella tendons. In cases where it is not possible to obtain sufficient material for the construction of two motors, only a single motor can be prepared, the antagonistic movement being provided in the artificial limb by a spring or an elastic.

The ansa motor is prepared by gathering the flexor



and extensor tendons together in such a way as to form a ring or loop which is covered with string whenever contraction of either of the two muscular groups occurs; this ring or loop displaces itself alternately either in an extensor or flexor sense, and the contractions are transmitted to the artificial limb.

In order to give greater consistency to the motors, they can be provided with a bony support.

It is nearly always necessary to sacrifice a certain quantity of the stump's original bone, but plastic motors can be obtained without compromising the length of the bone by tunneling the muscular bodies.

The author presents several cases in detail illustrating the above principles. Experience has proved that if the plastic motor is well placed, if the skin that covers it is healthy, if wounds are absolutely healed, neither the rings nor the rods cause the slightest harm. The disabled men get so accustomed to the metal rod that they leave it in place even at night. The rod must, however, be removed once every twenty-four hours, in order to clean it with alcohol and oil it with vaseline.

The muscular sense of stumps is not only recovered many times but they attain a degree of sensibility superior to the normal. Stumps lending themselves best to cineplastics are those that include healthy muscular masses, that retain normal innervation, and that possess an ample contractibility. The age and moral and intellectual condition of the patient are also important.

Cinematization does not invariably require operations with the knife. There are stumps already formed which are endowed spontaneously with cinematic resources.

The construction of the artificial limb is greatly simplified by the possibility of utilizing the intrinsic powers of the stump.

V. C. HUNT.

**Packard, G. B.: Report of Cases of Congenital Dislocation of the Hip.** *Colorado Med.*, 1918, xv, 138.

It is of great importance that congenital dislocation of the hips be diagnosed early, as the best results can be obtained only in cases which are seen in the first seven or eight years of life. With the aid of roentgen plates the diagnosis should not be difficult. The difficulty of reduction increases as the child's age advances. The author states that it is generally hard to reduce bilateral cases after the age of six and unilateral cases after eight years, and reduction should not be attempted when the shortening exceeds two inches.

He agrees with Ridlon that in the majority of cases the dislocation is superior and not posterior. In the superior dislocations the head can be felt in front on outward rotation of the limb and at the back on inward rotation; in the anterior type the head is felt in front but not in back on inward rotation; while in the posterior type the head can be felt at the back and not in front on outward rotation.

Ridlon states that few of the anterior dislocations remain in when replaced, while about 75 per cent of the superior dislocations remain secure when replaced. In bilateral dislocations perfect results in both hips are obtained in about half of the cases. The chief difficulty in obtaining a successful reduction is the shallow acetabulum.

A review of the different methods of treatment is given, and the author reports a series of 59 dislocated hips, 33 unilateral and 13 bilateral, which were treated by him, using the Lorenz and the Ridlon methods. Of the 59 reductions reported, 39 were anatomical cures, 16 anterior transpositions, and 4 posterior. The Lorenz method of reduction was used in 50 cases and the Ridlon method in the last 9 cases. The author thinks that the Ridlon method is more satisfactory, as it gives better stability in the joint and there is much less danger of fracturing the femoral neck or injuring the sciatic nerves or blood-vessels than from the Lorenz method.

E. C. Roos.

**Peckham, F. E.: A New Stabilizing Operation for the Foot in Infantile Paralysis.** *Am. J. Orthop. Surg.*, 1918, xvi, 397.

The operation consists of taking a long strip of fascia lata and transplanting it to the lower leg. In a case where the tibialis anticus and posticus were paralyzed, there was a marked toe-drop and the foot was turned outward. The tough fascia which enclosed the muscles and is attached to the tibia was split the whole length of the muscle. The lower end of the piece of fascia lata was arranged like a cuff around the tendons of the tibialis anticus and posticus, the dissected surface being next to the tendons and muscle belly. The foot was held in inward rotation and dorsally flexed on the leg, while the upper end of the fascia lata, pulled taut, was stitched down at the origin of the muscles. Then the whole length of the fascia lata was stitched to the fascia on either side where it had been divided to expose the muscles and tendons.

In another case where the common extensor and peroneals were paralyzed, an incision was made the entire length of the leg and the enclosing fascia incised. A long piece of fascia lata was transplanted, and a cuff formed around the lower end of the tendons above the annular ligament, the dissected surface being next to the tendons and muscle belly. The foot was held in strong outward rotation and dorsal flexion while the upper end of the fascia was stitched in place. Each side of the strip of fascia lata was then securely stitched to the edges of the divided fascia of the leg. The skin wounds were closed and the leg and foot encased in plaster of Paris for about six weeks.

In the first case the deformity was not sufficiently over-corrected when the fascia was stitched down, as more valgus is apparent when walking than when standing. In the second case the over-correction was better and the patient is walking solidly on the foot ten months after the operation. E. C. Roos.

**Robertson, R. S.: What Kind of Feet Must a Soldier Have?** *N. Y. M. J.*, 1918, cvii, 1032.

A soldier should have absolutely reliable feet at all times and under all conditions. He should not develop limping or short steps because of stretching arch supports due to faulty shoes as a civilian, so that later he has cramped or crooked toes or suffers from bunions. The present army shoe is designed to correct many deformities, but a soldier is apt to pick out shoes too short or too narrow, according to the author.

No two pair of feet are alike and no type can be described as typical. The size, i.e., length and breadth, must be proportionate to body weight and height. A short narrow stocky foot will never carry a heavy soldier with its proper vertical line of carriage entirely too far forward without putting an abnormal strain on all of the foot ligaments. The foot should not be muscle bound, but all the ligaments strong and elastic. Free movement and ability

to extend the foot should not be hampered by a short tendo achillis.

A proper foot can be brought to an angle of less than ninety degrees with the leg. It is a sign of a muscle bound foot if impossible. A foot pronated and rotated outward means the normal condition of weight-bearing at the ankle is reversed. As this condition becomes increased, severe flat-foot may be produced. A flexible anterior arch is indicated by wide apart, smooth, straight toes and on the ball of the foot there are found no corns or callosities. Cramped or overlapping toes may be due to too narrow shoes. Corns are a serious disadvantage. Stragglings are due to sore or crippled feet.

The normal foot is long, broad across the base of the toes, with freely movable joints, a fairly high instep, and a good arch; it is so balanced that in walking the weight rests on the outer edge of the foot and heel and across the base of the toes.

J. J. KURLANDER.

## SURGERY OF THE SPINAL COLUMN AND CORD

**Wayson, N. E.: The Pathology and Pathogenesis of Myelitis.** *Bull. U. S. Public Health Service*, 1918, No. 111.

Wayson gives an extensive review of the literature on the pathology and pathogenesis of myelitis, citing the opinions of various workers in this field.

His conclusions are that studies on the pathology and pathogenesis of myelitis show that the various hypotheses as to the genesis of its different forms have strongly supportive evidence, but no theory carries an overwhelming amount of this evidence. There seems to be, from the anatomic-pathological viewpoint, no reason for great dispute, since the various histological changes are seen in the different types of the condition, apparently dependent upon the rapidity of the process, in turn dependent upon the virulence of the infectious material for these structures. The localization in the cord seems dependent upon the mode of entrance and probably upon a specific factor, i.e., trauma in transverse myelitis. Extension through one or another system of the cord lends itself readily to the explanation afforded by anatomical structure. G. W. HOCHREIN.

**Sturgis, M. G.: The Surgery of Spinal Tumors.** *Northwest Med.*, 1918, xvii, 113.

The author reports two cases of spinal tumor, one extradural and the other intradural. The symptoms are given in detail and bring out the important points in diagnosis. He emphasizes the importance of diagnosing the condition before it has reached the final stage.

Pain is a variable symptom and can be disregarded in the presence of symptoms pointing to spinal tumor. Pain may be referred to other parts of the body, such as the lung, pelvis, or intra-abdominal viscera. It is no aid in differentiating from intra- or extradural tumor. M. A. BERNSTEIN.

**Ayer, J. B.: Focal Transverse Lesions of the Spinal Cord.** *Med. Clin. N. Am.*, 1918, i, 1143.

The author discusses focal transverse lesions of the spinal cord quite thoroughly, with the following summary:

Cases in which the onset is sudden; due to trauma. Symptoms of focal affections are complete, tending to improve. Pathologically it may be intramedullary hæmorrhage, fracture of vertebra, dislocation, the first named sometimes occurring alone, but more often all three are present. Diagnosis is aided by a history of the accident. X-ray differentiates fracture dislocation and disease. Treatment should be expectant at first, later orthopedic and at times operative.

Cases of rapid onset; due to acute infections. Symptoms are of obscure cord affections progressing rapidly, assuming a focal character and frequently resulting in complete transverse myelitis. Pathologically the condition may be myelitis, usually toxic; disintegration of the cord focally or epidural abscess. For diagnosis, the patient shows evidence of infection, the focus of which may or may not be evident. X-ray is negative as a rule. Spinal fluid in myelitis is apt to be negative; an epidural abscess shows the complete compression syndrome. Both are bacteria free. Treatment is expectant in myelitis and operative in epidural abscess.

Cases of slow onset; due to chronic infections, tumor or vascular condition. Symptoms show slowly increasing pressure on the cord at a given level. Pathologically it may be chronic syphilitic meningitis or meningomyelitis, tuberculosis of the vertebra, Charcot spine (gumma spine), tumor of the vertebra (usually metastatic), tumor of meninges, intramedullary tumors. For diagnosis, blood and spinal fluid tests, the findings and X-ray



examinations are of great value. Those due to vascular changes will usually show spinal fluid compression syndrome, for the most part incomplete, but some of the complete syndrome. Treatment should be anti-syphilitic for those having active syphilis, orthopedic and operative when necessary, and symptomatic. H. H. FREILICH.

**Frazier, C. H.: Laminectomy and Regional Anæsthesia.** *Ann. Surg.*, Phila., 1918, lxviii, 12.

Frazier advocates the use of regional anæsthesia for laminectomy in those cases where general anæsthesia is contra-indicated. A preliminary hypodermic of morphine and scopolamine is given. With the patient in position, a vertical line is drawn corresponding to the line of the spinous processes. Parallel to this are drawn two vertical lines 2.9 cm. to either side and at a point corresponding to the space between the transverse processes. A transverse line is projected at right angles to the midline.

The needle is inserted at the junction of the transverse and vertical lines.

The skin and subcutaneous tissues are infiltrated with novocaine and a platinum needle is introduced at an angle of 45 degrees or less to the transverse line and 35 degrees to the skin. The average distance to the nerve is 3 cm. in the upper thoracic and 4 cm. in the lower thoracic and lumbar regions. The patient feels pain when the nerve is reached. Five to 10 ccm. are injected in each nerve and usually four nerves are injected on each side. If necessary, supplemental injections of novocaine solution may be made. For handling cord structures or posterior nerve roots, 4 per cent stovaine applied directly on cotton is of value.

This method is of greatest value in the thoracic region. It is dangerous in the cervical region because of the proximity to the phrenic center. For lumbar laminectomy spinal anæsthesia is preferable.

LISTER TUHOLSKE.

## SURGERY OF THE NERVOUS SYSTEM

**Cone, S. M.: Some of the Results of Work on the Pathology of Peripheral Nerve Injuries.** *Am. J. Orthop. Surg.*, 1918, xvi, 319.

The author has developed a technique for the staining of nerves in tissues by which he can differentiate the structure of young and adult nerves.

By experimenting on nerves of amputated stumps, sciatic nerves in guinea-pigs, and autopsy material, he was able to make the following observations:

1. The Schmidt-Lautermann incisors are not artefacts but neurokeratin material, and this material is the basis of the curious cone-shaped, regularly placed appearances on all adult nerves which have not undergone degeneration or postmortem change.

2. The young nerve may be distinguished from the adult nerve.

3. In a "nerve callus," very active, widely growing young nerves are seen at the torn ends. Adhesions are full of them, and fat carries them better than muscle.

4. The "nerve callus" and bulbs are made up of nerves and connective tissue,—much more of nerves. These young nerves form fasciculi which interlace in the adhesions and "nerve callus." Some are seen discrete among older bundles in loose and denser fibrous tissue. They show a great preference for the lines followed by blood-vessels, and in some cases appear in thrombosed vessels.

5. The tissue at the end of the torn nerve is not as much scar tissue as commonly thought; it is usually a mass of interlacing young nerves in fascicular arrangement.

6. Nerve fasciculi and tendrils are shown in painful scars and bulbs of amputation stumps.

7. A painful nerve bulb on an old grafted ulnar was found swollen by wildly growing young nerves, and very little connective tissue was present.

8. In several instances foreign materials, cloth, silk, and cotton, were seen surrounded by foreign-body giant cells and young nerve fibers.

The percentage of cases in which nerves were found is: the proximal end (the end cut at operation farthest from the original injury) 100 per cent; middle (at injury) 78 per cent; distal end, 95 per cent; and adhesions, 80 per cent. It appears that the distal end may get a central (spinal) connection from surrounding nerves (torn long before) by a bridging of the gap by adhesions, by fibers crossing the scar at the site of injury, and by a strand of normal nerve left uninjured.

The author reviews the work done by various other authors on this subject. E. C. ROOS.

**Rojas, P.: Experimental Degeneration and Regeneration of Peripheral Nerves** (Degeneracion y regeneracion experimental de los nervios perifericos). *An. d. Inst. mod. d. clin. méd.*, Buenos Aires, 1917, ii, 218.

A series of studies are being made in the Laboratory of Histological Pathology of the Instituto Modelo de Clinica Medicina attached to the Hospital Rawson, Buenos Aires, on the degeneration and regeneration of peripheral nerves. In this present study the historical aspect of the whole question is gone over, reviewing the work and findings of various experimentors and also some experimental work done in the Institute.

The following conclusions are drawn:

1. In the peripheral nerve two forms of retrogression may be observed; one is the classical wallerian degeneration, the other is necrobiosis.

2. The first is a biologic process and is produced only in the living or surviving nerve; the second represents the death of the nerve.



3. The nature of the medium in which the isolated nerve must live determines the form of retrogressive changes; it continues living in auto-transplantation and partly in homotransplantation; in heterotransplantation it dies. W. A. BRENNAN.

**Meuriot, H., and Platon: One Hundred Cases of Isolation of Liberated Nerves in Rubber Sheaths** (100 observations d'isolation des nerfs par manchonnage du caoutchouc). *Bull. et mém. Soc. de chir. de Par.*, 1918, xliv, 850.

The authors have found that the results of placing a liberated nerve in muscular tissue are not good. Instead of acting as a protection, the muscle tissue becomes strongly adherent. They have resorted to the use of rubber strips which are wound spirally around the freed nerve. The operations included 32 on the ulnar; 13 on the median and ulnar; 27 on the median; 18 on the sciatic; 8 on the radial; and 2 on the plexus.

In 93 of their 100 cases the authors have found a total absence of reaction between the nerve and the rubber; there was perfect tolerance. In 5 cases there was septic reaction and in 2 aseptic reaction, which necessitated removal of the rubber. From the unsuccessful cases the authors have learned that in order to avoid failure it is necessary to bury the nerve-trunk in its rubber sheath deep in the tissues and to avoid any contact with cutaneous cicatrices. They systematically resect any cicatricial tissue likely to come in contact with the sheath.

The results obtained were as follows:

1. Of 47 patients operated upon for painful phenomena, and in which there was no other treatment but isolating the freed nerve in rubber, the pains disappeared in 41. In 4 cases there was no change; and in 2 no findings.

2. Of 74 cases in which there was motor disturbance, 55 have been improved. In 16 cases the nerve was sutured. These statistical results have been obtained after several months' supervision of the cases, as it is only after a considerable time, especially in the case of paralysis, that the effectiveness of the rubber sheaths can be judged as a means of protection, particularly after suture; and the results must be compared with those obtained from other procedures.

In the discussion both Delbet and Mauclairé referred to cases within their knowledge in which rubber nerve sheaths have been well tolerated for one or more years.

W. A. BRENNAN.

**Gill, A. B.: Surgery of Spastic Paralysis.** *Ann. Surg.*, Phila., 1918, lxvii, 529.

The author reviews the work on spastic paralysis which may be of intra-uterine origin, due to cerebral defects, hæmorrhage or softening, syphilis, specific fevers, eclampsia and convulsions, etc.; or due to injuries of the head during birth; or, finally, may be acquired after birth from hæmorrhage, chronic meningitis, hydrocephalus, etc. The prognosis is more unfavorable and the treatment more difficult

because many children with spastic paralysis are mentally subnormal or even idiotic.

The symptoms are dependent upon the distribution and degree of spasticity and weakness, and upon the mental characteristics.

The various operative measures that have been employed to improve the condition of these patients are briefly reviewed.

Tenotomy of the contracted muscles is the oldest and most commonly employed procedure for relief of spastic paralysis. It has two values: it relieves the weak opposing muscles from constant overstretching, and it breaks the vicious circle formed by tendon, afferent sensory nerves, spinal center, efferent motor nerves, and muscle. Tenotomy of the contracted muscle tendons, however, has not proved uniformly successful in practice. In many cases there has been a recurrence of the original condition, and in numerous cases an opposite deformity has been produced.

Foerster's operation of the resection of the posterior spinal roots for spastic paralysis is so difficult and severe as to preclude its common use.

Stoëffel weakens the strong contracted muscles by resecting a portion of their nerve supply, stating that there is no real muscle shortening present, as is shown by the disappearance of the spastic condition under an anæsthetic. Therefore a tenotomy lengthens a muscle which is not shortened and permits the development of an opposite deformity.

He corrects talipes equinus by resecting a portion of the popliteal nerve in the popliteal space. The electrode is used in distinguishing the nerve-bundles which supply the various muscles. For contracture of the hamstring muscles, operation is performed upon the sciatic nerve in the upper part of the thigh. For adductor spasm one or both branches of the obturator nerve are excised. In the upper extremity the median nerve is exposed in the flexure of the elbow and the branch going to the pronator radii teres and the branches to the various flexor muscles of the wrist and fingers are resected as desired.

The author reports a series of five cases which he has operated upon in this way, illustrating the improvement which occurs after nerve resection. In several instances a second operation was performed when it was found that too little of the nerve supply had been resected at the first operation. In operations on the lower extremity the results have appeared to be uniformly successful and satisfactory, while resections of the median nerve of the arm do not produce as good functional results, although the cosmetic results are satisfactory.

Following operation the after-treatment should be thorough and persistent in educating the weakened muscles and in securing co-ordination.

The author has considered a modification of the Stoëffel operation; instead of partial nerve resection, he proposes a transplantation of the same nerves into the weak opposing muscles. Anatomical difficulties would not permit of the universal application of this procedure.



Sharpe's cerebral decompression for spastic paralysis is on trial, but it would appear to be of value only in recent cases, and particularly in the newborn.  
E. C. Roos.

**Stopford, J. S. B.: So-Called Functional Symptoms in Organic Nerve Injuries.** *Lancet*, Lond., 1918, cxciv, 795.

Patients with an undoubted organic injury of a peripheral nerve, with its usual accompanying picture of paralysis may also exhibit functional symptoms, so that trauma plays a much less inconspicuous part in the production, localization, and persistence of functional manifestations than it is usually expected to do.

Two classes of cases are discussed: first, those in which the functional element predominates and consequently there is grave risk of the case being diagnosed as purely hysterical. To prevent this error the faradic response of all the affected muscles must be investigated. The second group are those cases in which the organic symptoms are more apparent. The diagnosis of this group is much less difficult, but the treatment of the functional element must not be overlooked. Rational treatment must be directed to all possible factors in the production of these conditions. The source of irritation must be corrected, then psychotherapy applied for the relief of the motor and sensory functional symptoms.

Five case reports are cited to bring out different phases of the mixed condition and a line of treatment outlined for the handling of the psychic element present.  
P. W. SWEET.

**Stiles, H. J.: Operative Treatment of Nerve Injuries.** *Am. J. Orthop. Surg.*, 1918, xvi, 351.

The general principles used by the author in operating upon injured nerves are given, including the desired armamentarium and technique. He states that the dissection to expose the injured nerve should rather be too extensive than too limited, and that the nerve should be freed and exposed both above and below the lesion. The

branches of the nerve should be conserved as much as possible. Often surrounding muscles, as well as the nerve, are bound down by cicatricial tissue, and should be freed, requiring often a repair or transplantation of tendons.

If the nerve has been completely divided, enough of the bulbous or cicatricial stumps should be divided to expose nerve bundles throughout the entire surface of both stumps. If the nerve has not been completely divided, the treatment will depend on the muscular response present. No hard and fast rules can be laid down in partial lesions of nerves, and each case must be judged on its own merits. Stiles favors exsection, provided that the two stumps can be brought together without tension.

In suturing the nerve, a single through-and-through suture of the finest linen is sufficient for even the great sciatic. Every effort should be made to bring the corresponding fibers of the two stumps into apposition, so that there is no unequal rotation of the stumps. A sufficient number of sutures to prevent protrusion of nerve fibers are then placed through the sheath. The nerve should be embedded either in fatty cellular tissue or healthy muscle, and not in fascia and other materials which only promote the formation of cicatricial tissue. It is very seldom necessary to introduce a tube for drainage into the wound.

When flexion of the adjacent limb is necessary to take the tension off the nerve, the limb should be carefully splinted, and too great haste should not be used in again straightening it.

The author thinks that the treatment in these cases is often too conservative, and that valuable time is wasted in waiting for a recovery, which, in the end, is usually only very partial. If there is definite evidence present that improvement is taking place, operation may be delayed, but usually the operation will not only expedite recovery, but at the same time it will render it more nearly complete.

The essential points in the anatomy and technique of individual nerve operations are concisely outlined.  
E. C. Roos.

## MISCELLANEOUS

### CLINICAL ENTITIES—TUMORS, ULCERS, ABSCESES, ETC.

**Farmachidis, C. B.: New Researches on the Cobra Reaction in the Diagnosis of Carcinoma** (Nuove ricerche sulla cobrareazione per la diagnosi di carcinoma). *Riforma med.*, Napoli, 1918, xxxiv, 382.

In 1915 the author published his first experimental results on the utility of the cobra serum reaction in the diagnosis of carcinoma. He has since followed this study in a large number of cases, modifying his former technique in some particulars. He has fixed the reaction dosage as 0.1 ccm. of a 1:20,000

solution of cobra venom (1 part of cobra solution at 1:5,000, and 3 parts of physiologic solution) because a weak solution has given better results. A 5 per cent red cell suspension from guinea-pigs is used. The scheme of the reaction with guinea-pig suspension is shown in an accompanying table.

This reaction method was tested in 16 subjects with carcinomatous tumors; and in 18 subjects with fibroma and various other non-carcinomatous affections. The carcinomatous cases gave 14 positive reactions and 2 negative. There was no reaction in the non-carcinomatous cases.

By adopting a suspension of red cells from rabbits

instead of guinea-pigs the author obtained the following results:

In 64 cases affected with carcinomatous tumors there was more or less complete hæmolysis within twenty hours and hence positive reaction in 53. In the remaining 11 cases the reaction occurred but only after a delay of from twenty to thirty-five hours.

In 62 cases with non-carcinomatous affections there was no reaction by the cobra venom solution. The reaction in all cases considered as positive takes place within twenty-four hours. Cases in which a reaction occurs after a longer period are considered negative.

The author concludes that since cobra venom almost constantly activates hæmolysis with serum of carcinomatous subjects toward the red cells of guinea-pigs or rabbits, while such hæmolysis is absent in non-carcinomatous subjects, the reaction may be considered as specific for carcinoma and is thus of great use in clinical diagnosis.

W. A. BRENNAN.

**Kettle, E. H.: Tumors Arising from Endothelium.**

*Proc. Roy. Soc. Med.*, 1918, xi, Sect. Pathol., 19.

Two cases of tumors arising from endothelium are reported by the author. A detailed report of the macroscopic and microscopic examination in each case is given, with very clear cuts of the microscopic sections.

He states that endotheliomata may be differentiated from other neoplasms by the following points: an undifferentiated polymorphic-celled type of growth; a whorled arrangement of the cells with the formation of elongated tubules and narrow trabeculae; the presence of tumor giant cells; the close association of the growth of blood-vessels; and the formation of lumina or channels which may contain blood.

E. C. ROOS.

**Harvey, R. W.: The Colloidal Gold (Lange) Test in Diagnosis.**

*Calif. St. J. Med.*, 1918, xvi, 170.

Observations on this series support the opinion of previous workers that while the colloidal gold test is valuable, it does not replace other tests but confirms them and in some instances assists in a prognosis. The test is valueless unless a satisfactory indicator is prepared. It is simple of execution, and the error is small if the precaution be observed of obtaining blood-free spinal fluid in clean, sterile tubes.

In congenital lues the reaction does not add to the evidence given by other spinal fluid tests, but it is of confirmatory value. In tabes the test, besides confirming evidence from the other sources, may, when it gives a paretic curve, predict the development of a paresis. In tabes and cerebrospinal lues it may be positive in cases in which the Wassermann, cell count, and globulin are negative. In general paresis it is invariably positive and is of absolute value in differentiating between general paresis on the one hand and tabes and cerebrospinal lues on the other. In normal fluids it is invariably negative,

if Miller's rule of counting all color changes below 2 as negative be followed.

Where the laboratory facilities are such that care and time may be devoted to the preparation of a suitable indicator, the test should be performed on every spinal fluid; the data for diagnosis is incomplete otherwise.

MAX KAHN.

**Goto, K.: A Study of the Nitrogen Metabolism and of Acidosis After the Transplantation of a Ureter into the Duodenum in Dogs.**

*J. Exp. Med.*, 1918, xxvii, 449.

Numerous reports, both clinical and experimental, have discussed the feasibility of implanting a ureter into some part of the intestinal canal, and have described methods of operative procedure. The literature was reviewed in 1909 by Steinke who concluded that the results show that under certain conditions the ureter may be transplanted successfully. The failures, however, are numerous, the ultimate results uncertain, and a fatal termination is so apt to occur that no definite claim for the operation can as yet be made. Most experimental studies, as those recently made by Steinke (1900), Stewart (1910), and Sweet and Stewart (1914) have been especially concerned with the ascending infection of the kidney and the mechanical dilatation of the ureter following operation.

In order to avoid some of these difficulties, peritonitis, ascending infection of the kidneys, and stenosis of the ureteral orifice where it enters the intestine, with resulting hydro-ureter and hydronephrosis, Sweet and Stewart devised the following method of operation.

The right ureter of the dog is isolated and severed close to the bladder, and the free upper end passed through the lumen of the greater pancreatic duct into the intestine. This operation is made possible in the dog by the fact that this animal possesses at least two pancreatic ducts, both of which are separate from the bile-duct. In Sweet and Stewart's series eight dogs were used, and in some nephrectomy of the left kidney was done at a later date. In none of the animals was there evidence of infection of the kidney, but in some distinct evidence of obstruction was found, and in all death resulted after varying intervals of time with symptoms suggestive of an intoxication.

In experiments such as those cited above, an intoxication in the absence of infection suggested to the author intoxication from: (a) disturbance of kidney function, or (b) absorption of urinary constituents draining into the intestine. It was with the hope of throwing some light upon this intoxication that Goto undertook the present study.

In this series of experiments six dogs were used; in two a ureter-intestinal transplantation was performed, and four were used for various controls. As a result of this study Goto makes the following summary:

1. The present work was undertaken to study the metabolism in the dog after a ureter-intestinal



transplantation. Four dogs were originally operated upon. Two showed kidney infection; the other two were not infected, and in these the metabolism was studied. One of the latter showed a marked hydro-nephrosis and hydro-ureter.

2. Both after the transplantation of the right ureter into the intestine and the ligation of the right ureter, there is generally a moderately increased output of nitrogen in the urine and, in the former instance especially, a retention of nitrogen in the blood, but no change in carbon dioxide content in the blood. The significance of this is probably an increased tissue catabolism, the cause of which is doubtful without further work.

After removal of the left kidney subsequent to transplantation of the right ureter into the duodenum, renal insufficiency and resulting retention developed. The non-protein and urea nitrogen in the blood steadily increased and the carbon dioxide content of the blood diminished to the level characteristic of a moderate acidosis. No ketones were found in the blood. The dogs died five to ten days after the nephrectomy under conditions characteristic of suspended renal activity, deep respiration, unconsciousness, and sopor. GEORGE E. BEILBY.

**Soubeyran: Traumatic Shock in the Untransportable Severely Wounded** (Considérations sur le choc traumatique chez les grands blessés intransportables). *Bull. et mém. Soc. de chir. de Par.*, 1918, xliv, 672.

After a recent offensive the author received 445 untransportable severely wounded in his service. There were 145 deaths, 40 of these dying unoperated almost immediately after arrival. There were 53 cases in which shock is distinctly mentioned; and if the 40 inoperable cases be included, it gives a total of 93 cases of shock among the very severely wounded. In the 53 clear shock cases, there were 48 deaths, 11 were not operated upon and 42 were operated upon in spite of shock. All non-operated cases died; the operated cases gave 5 recoveries.

Soubeyran classes primary shock as hæmorrhagic and non-hæmorrhagic; the latter may accompany medium or very severe wounds. He distinguishes between pure hæmorrhage (acute anæmia) and shock, and gives the following differentiation: (1) If the patient is seated, the tendency to syncope is much more marked in hæmorrhage than in shock. (2) The pulse in acute anæmia varies according to the position of the patient; it is unstable, sometimes rapid, sometimes slow. It is more stable in shock. (3) The facies is pale and white in the anæmic; it is livid in shock. (4) Hæmorrhagic cases are more agitated than the shocked. (5) Hæmorrhagic cases show good results from the injection of serum or a blood transfusion; the shocked derive little benefit from these methods, so far as the author has seen. In a non-hæmorrhagic shocked patient with medium wounds, the shock is a nervous shock. In non-hæmorrhagic shock with important wounds, the shock is that of the multi-wounded.

Soubeyran considers that secondary shock is bound up with infection. In an abdominally wounded patient not shocked at first but dying the second or third day, Soubeyran cannot see any difference between peritoneal septicæmia and secondary shock. He also remarks that it is usually in injuries below the diaphragm and especially in abdominal injuries with very abundant hæmo-peritoneum that shock is observed. The injured region is therefore an important factor. Conditions at the time of injury, cold, fatigue, hunger, etc., are also important factors, especially when wounds are not very severe.

With regard to operating upon the shocked, Soubeyran thinks: (1) if an important hæmorrhage exists, a hasty hæmostasis should be made while heating the patient; (2) if there is a limb lesion, the patient should first be made warm and given stimulants, but not for more than two hours; (3) the abdominally shocked as well as those with multiple wounds should be let alone, as these do not modify by treating the shock.

The therapeutics of shock as carried out by the author consist of heating, keeping the head low, giving morphine and Todd's potion, and injecting strychnine in rather high doses. The intravenous administration of serum in doses not exceeding 250 gr. repeated is preferred to subcutaneous injections. Locke's serum is preferred. In the hæmorrhagic it gives as good results as blood transfusions.

W. A. BRENNAN.

## BLOOD

**Dubin, H., and Pearce, R. M.: The Elimination of Iron and Its Distribution in the Liver and Spleen in Experimental Anæmia.** *J. Exp. Med.*, 1918, xxvii, 479.

In an earlier report Dubin and Pearce presented the results of a study of the elimination and storage of iron in transient experimental anæmias due to a single injury. These they found were not characterized by an increased elimination of iron in the fæces or in the urine, except as an accompaniment of hæmoglobinuria. On the other hand, an increased storage of iron in the liver and spleen was constantly observed. These observations support well known views concerning the power of the body to conserve iron, and suggest that some other factor besides blood destruction must be operative in those hæmolytic anæmias in man characterized by excessive elimination of iron in the fæces.

The natural assumption was that in the hæmolytic anæmias there existed some disturbance of the mechanism concerned in the retention or conservation of iron, and they have now studied a chronic type of experimental anæmia in order to determine whether chronicity may be the factor. In the present series of experiments trypanosoma equiperdum has been used to cause a continuous blood destruction in dogs. It was hoped that in the long continued and progressive anæmia so produced



they might find an experimental condition approximating the hæmolytic anæmias of man.

These methods of experiments and analysis were the same as described in a previous paper and need not be repeated. From their study they are able to draw the following conclusions:

In the continuous blood destruction, essentially a chronic experimental anæmia caused by infecting the dog with *trypanosoma equiperdum*, no increased elimination of iron is observed in the fæces. The storage of iron in the liver and spleen under these experimental conditions is somewhat greater in amount but of the same general character as in transient experimental anæmia.

Splenectomy before or after infection, i. e., the development of anæmia, influences neither the elimination of iron in the fæces nor its storage in the liver.

The retardation of the course of the trypanosome infection and thus the production of a more chronic anæmia by treatment with a trypanocide, arsenobenzol, likewise does not affect iron storage.

These experiments have therefore failed to reproduce the changes in iron metabolism seen in certain of the chronic hæmolytic anæmias of man.

In the presence of a bile-duct-ureter fistula, the iron content of the mixture of urine and bile is not appreciably greater than that of the urine alone. In the dog, therefore, the elimination of iron in the bile would not appear to be an important factor.

On the other hand, when bile is excluded from the intestine, an unusual storage of iron occurs in the spleen. For this no explanation is offered.

GEORGE E. BELLBY.

**Petersen, E.: Anæmia of a Type Resembling Pernicious Anæmia During Pregnancy** (*L'anémie d'un type ressemblant à l'anémie pernicieuse durant la grossesse*). *Arch. mens. d'obst. et de gynéc.*, Par., 1918, vii, 1.

Petersen gives the clinical histories of three cases of pernicious anæmia, or, as he, with Esch, prefers to call it, anæmia of the pernicious type during pregnancy; these cases were observed by him at the Rigshospitalet, Copenhagen. Anæmias which are met with during pregnancy differ from true pernicious anæmia and seem to owe their origin to the pregnancy itself. The first symptoms are scarcely observed before the second half of pregnancy. After labor it most frequently undergoes a rapid aggravation, but in some cases it clears up. The prognosis is very grave, and medical treatment is generally ineffective.

Interruption of the pregnancy ought to be regarded as the treatment for removal of the cause. It is indicated if medical treatment fails. Patients ought to be treated according to the general rules of pernicious anæmia. The best results seem to be obtained from intramuscular injections of defibrinated human blood. Two of the author's cases died. The third recovered after interruption of the pregnancy.

W. A. BRENNAN.

**Harvey, S. C.: Fibrin Paper as an Hæmostatic Agent.** *Ann. Surg.*, Phila., 1918, lxviii, 66.

The various methods of obtaining hæmostasis are briefly given. The method for preparing the fibrin paper is described as follows: The fibrin of beef blood is obtained from a slaughter house. This is passed through a fine meat chopper, then washed in running water for twenty-four hours in order to free it of the other constituents of the blood. It is then shredded by prolonged trituration in a mortar and shaken up with about twice its volume of water. This is thrown, while in suspension, into a tray with a screen bottom, over which is laid a single layer of ordinary surgical gauze. With a slight oscillatory movement of the tray, the water runs through, leaving an even layer of fibrin deposited on the gauze. This is covered with another layer of gauze and turned out on a towel, being handled gently so as not to tear the fibrin film. The whole is placed between two towels of double thickness and introduced between two pressure plates of cast iron, as shown in an accompanying figure. These plates are approximated with as great pressure as possible by the tightening of the bolts inserted at their edges. The apparatus is placed in an autoclave and treated with a steam pressure of 15 to 20 pounds for thirty minutes. On removing the film it is found to be welded into a sheet of paper-like material from which the gauze can be readily stripped off, leaving a rough surface. The thickness of this sheet depends of course upon the amount of fibrin thrown upon the screen.

It is grayish brown in color and can be repeatedly sterilized by boiling or steam. Small pieces the size of a stamp placed over arteries the size of the secondary mesenterics of a dog control bleeding after one to two minutes' pressure. It can be used in hæmorrhage from the liver, kidney, brain, and other tissues. It can be dried and stored for months. When needed, a piece may be boiled for ten minutes and put into sterile salt solution until used.

CARL R. STEINKE.

**Guiou, N. M.: Blood Transfusion in a Field Ambulance.** *Brit. M. J.*, 1918, i, 695.

The author shows that the operation of blood transfusion is easily applicable to the forward arm, where it is most needed, especially in cases of severe primary hæmorrhage. He cites two illustrative cases, both of which were transfused after being admitted to an advanced dressing station and before they reached the casualty clearing station.

For group testing, the Moss-Brem classification was used, the two known serums of groups 2 and 3 being kept on hand and tested macroscopically against the corpuscles of the intended donor and also against those of the patient. As the result of this test, both donor and recipient are placed in one of the four groups and a suitable donor is easily and quickly found. This group testing requires only a few minutes of time.

The syringe method of transfusion with glass



cannula was used. Two inches of thick-walled rubber tubing were fitted to each cannula, one inch being left free to receive the end of the syringe. Five per cent carbolic was used for numbing and sterilizing the skin. The veins were dissected out and ligatures placed. The cannulas were then introduced after cutting the respective veins, that in the donor being directed distally.

By pinching the rubber tubing the cannulas were blocked. Four 20 ccm. glass syringes were used, each syringe fitting snugly in the rubber connection. These were kept going in a cycle, being washed out each time in a vessel of boiled saline and laid on a piece of sterile gauze ready for use. Plugging of the donor's cannula by the wall of the vein drawn against its end was overcome by stopping suction on the syringe and sliding the cannula slightly in and out.

The author did not state what method he used to prevent clotting of the blood.

E. C. ROOS.

### BLOOD AND LYMPH VESSELS

**Emerson, M. L.: Rupture of the Deep Epigastric Artery by Muscular Strain; Report of a Case.**  
*J. Am. M. Ass.*, 1918, lxx, 1145.

The patient, a woman of forty-two, stated that four hours before reaching the hospital, while trying to place a curtain rod over a window bracket, she had jumped up a few inches from the floor, extending her body on her right leg. She had suddenly been seized with a severe pain in the lower left abdomen, had fallen to the floor and then fainted. She awakened to find that she had been placed on her bed. She felt cold, with clammy sweats, and was thirsty and very restless. She stated that she had been in the habit of wearing a long, unusually tight corset to disguise the effect of her rapidly increasing weight.

Upon examination the patient was found to be somewhat pale, but not suffering from shock. She was very restless, however, and was nauseated, having recently vomited. A sensitive and painful condition of the lower abdomen would not permit a satisfactory examination. She complained of a burning sensation in the left lower quadrant. A diffuse dullness was also apparent in this region. The pelvic examination was negative. The temperature was 99.6; the pulse 100; white blood count 15,400; polymorphonuclears 86 per cent. After eight days the painful, indurated condition of the lower left abdomen became an easily palpable tumor of the abdominal wall, verified by bimanual examination.

At operation, through the deep fascia was revealed a large blood-clot, containing about two cupfuls of clotted blood. Evidently the hæmatoma had developed at the expense of the peritoneum, which was blood-stained from the severed ends of the deep epigastric artery and vein which lay on the surface about three-fourths of an inch apart. The artery was easily demonstrated lying on the peritoneum. It had been severed about midway between Pou-

part's ligament and its entrance into the lower portion of the rectus sheath. Although active bleeding had long since ceased, both ends of the severed artery and vein were tied and a few strands of twisted silkworm gut left in the wound for a few days. Convalescence was uneventful, the patient leaving the hospital in three weeks.

EDWARD L. CORNELL.

**Buquet, A.: Arteriovenous Aneurism of the Femoral Vessels in Hunter's Canal with a Projectile in the Sac** (Anévrisme artério-veineux des vaisseaux fémoraux dans le canal de Hunter; extirpation; projectile inclus dans le sac). *Bull. et mém. Soc. de chir. de Par.*, 1918, xlv, 870.

Only a few cases of arteriovenous aneurisms with a projectile in the sac have been reported in war literature. The case now reported is that of an arteriovenous aneurism in Hunter's canal; a piece of shell was fixed between the artery and vein emerging through the wall of the aneurismal sac. Total extirpation of the aneurism after quadruple ligation was done. Recovery followed without unusual incident.

W. A. BRENNAN.

**Goodman, C.: Experiments Outlining the Limitations of Operation on the Abdominal Aorta.**  
*J. Exp. Med.*, 1918, xxvii, 569.

From the results of the five experiments presented in this report, there seems to be no difficulty in correcting injuries of the abdominal aorta in dogs, with subsequent perfect restoration of the continuity of the vessel. The complete occlusion of the aorta for a period of thirty minutes is not necessarily followed by serious consequences. For lateral defects in the aorta, or for injuries not involving the entire circumference, a rectangular clamp may be applied for a prolonged period in order that the circulation should not be completely cut off. An operative field free from blood can thus be obtained while the circulation is maintained through the remaining lumen of the aorta.

In the instances in which a portion of the aorta must be resected, an arterial segment taken from another animal can be safely utilized as a transplant. Smaller vessels can be adapted to the caliber of the aorta by the following procedure which was devised by Jeger and Helmuth Josef. The artery is split longitudinally, the ribbon thus formed is then folded double, and both edges are closed with a continuous suture of very fine silk. In this way a tube double the original size of the vessel is made which is then transplanted end-to-end between the resected ends of the aorta.

Further experiments were undertaken by Goodman to determine the practicability of re-establishing the continuity of the severed aorta by the circular suture. The results obtained seem to indicate that while the operation is possible, the difficulty of approximating the severed ends during the suture is greatly increased on account of the retraction of the aorta tube. The approximation

entails such injury that the aorta is completely severed. The introduction of a transplanted segment would be indicated and the procedure would be the same as when a portion of the aorta had been removed.

From Goodman's experiments on six dogs and his study of the problems involved, he makes this summary:

1. Injuries of the abdominal aorta in dogs may be corrected with subsequent perfect restoration of the continuity of the vessel.

2. The complete occlusion of the aorta for a period of thirty minutes is not necessarily followed by serious consequences.

3. In cases in which a portion of the aorta must be resected, an arterial segment taken from another animal can be safely utilized as a transplant.

4. While the re-establishment of the continuity of the severed aorta by the circular suture is possible, the approximation of the severed ends during the suture entails such injury that thrombosis frequently occurs. Therefore, when the aorta is completely severed, the introduction of a transplanted segment is indicated.

5. An arterial tube of increased caliber made of smaller vessels such as the carotid lends itself readily as a transplant to the severed aorta, with a reasonable assurance of re-establishing the continuity of this vessel.

6. Defects in the aorta can be readily corrected by the use of fascial transplants with minimum danger of thrombosis.

GEORGE E. BEILBY.

**Tenani, O.: Further Contribution to Perivascular Sympathectomy as a Treatment for Causalgia** (Altro contributo alla simpaticectomia perivasale come trattamento della causalgia). *Policlin.*, Roma, 1918, xxv, sez. prat., 749.

Tenani reports the case of a soldier, wounded by a shell fragment in the left axillary region, who showed an intense causalgic syndrome of the upper limb. On exploration the sheath and wall of the axillary artery were found injured, being exactly in the path of the projectile. On resecting the sheath of the local venous and arterial trunks the causalgic syndrome rapidly disappeared. The case showed that the causalgic phenomena were concomitant with a lesion of the peri-arterial sympathetic system and that a removal of the sheath about the lesion causes their disappearance.

The author is inclined to give importance to the injury of the vessel wall as well as to that of the vascular sheath, differing in this view from Leriche, who thinks that the causalgia is due to the injury of the sheath particularly. Sympathectomy brings about a vasodilatation with elevation of the compensatory pressure causing a greater velocity and abundance of the blood flow in the region; thus some of the pathogenic conditions underlying the causalgia are obviated.

Pirondini thinks that the very favorable results obtained by Leriche, LeFort, and others, as well as

in his own case, encourage surgeons to try perivascular sympathectomy as a means of combating causalgia. The operation may not always be successful, especially when the sympathectomy is not total, or in cases where the causalgic syndrome is accompanied by lesions of the nerve-trunks which should be separately operated upon.

W. A. BRENNAN.

## POISONS

**Taylor, H. D., and Austin, J. H.: The Action of Antiseptics on the Toxin of Bacillus Welchii.** *J. Exp. Med.*, 1918, xxvii, 375.

It seemed desirable to the authors to perform a series of experiments with a definite toxin which could be quantitatively measured and a suitable susceptible animal as an indicator. Bull and Pritchett have demonstrated a toxin for bacillus welchii which fulfils all the requirements of the so-called group of soluble or exotoxins. They have standardized the virulence of this toxin, and confirmed the unpublished observation of Flexner that the pigeon is highly susceptible to the toxin and that the lesions produced in this animal are similar to those observed in human cases of gas gangrene.

As wounds infected with bacillus welchii are frequently encountered in military surgery today, and as the antiseptics studied are used extensively on wounds of this character, it was decided to use the toxin of Bull and Pritchett and the pigeon as a very sensitive indicator of the relative toxicity of the various toxin-antiseptic mixtures in the series of experiments here recorded. Ten experiments were performed. Comparable results were obtained in all.

The following conclusions are drawn from this work:

1. Dakin's hypochlorite and chloramine-T solutions will protect pigeons against multiple fatal doses of the toxin of bacillus welchii when the antiseptic and the toxin are mixed *in vitro* and allowed to stand in contact for five minutes before injection.

2. The detoxicating action of the solutions is demonstrable also in the presence of serum.

3. Phenol solution, 0.25 per cent, has no such action.

GEORGE E. BEILBY.

## ROENTGENOLOGY

**Tousey, S.: Device for X-Ray Location of Bullets and Other Foreign Bodies in Wounds.** *N. Y. M. J.*, 1918, cviii, 1.

The author covers the plate with a one-eighth inch mesh of galvanized wire netting. This is radiographed upon the plate at the same time as the foreign body. The tube is at a measured distance from the plate: 14 inches for the extremities, or 21 inches for the head or trunk. Two exposures are made, the tube being displaced laterally 2 inches for the extremities or 3 inches for the head or trunk, before the second exposure. The image of the foreign



body is displaced unless it is in contact with the plate. A printed table gives the distance of the foreign body from the plate corresponding to whatever number of meshes the image is seen to be displaced. This table should invariably be used to save time and especially to avoid the possibility of grave error in an extemporaneous calculation.

A lead marker fastened upon the skin where it rests upon the plate furnishes a topographical guide to the position of the foreign body; while the displacement of the image indicates its distance from the surface in contact with the plate.

**Pilon, M. H., and Baker, T. T.: Radiographic Examination of Metals.** *Arch. Radiol. & Electrotherap.*, 1918, xxiii, 27.

By virtue of the high penetrating powers of rays obtainable with the Coolidge tube and the extreme sensitiveness of intensifier screens, it has been possible to utilize the roentgen rays in industrial science to record photographically the structure of castings and possible flaws in sheets of metal of a thickness of two inches or more. This has opened up a new branch of roentgenographic work and has also had a bearing on the question of the protection necessary to make it safe to work near rays of extreme penetration.

ADOLPH HARTUNG.

**Johnston, G. C.: Roentgen Diagnosis of Diseases of the Chest.** *Am. J. Roentgenol.*, 1918, v, 323.

The author briefly describes a routine roentgen examination of the chest, noting the various structures as they appear normally on the screen or plate. He then gives the roentgen findings in different pathological conditions of the lungs such as pneumonia, bronchopneumonia, pulmonary oedema, emphysema, lung tumors, diseases of the pleura, pulmonary abscesses, and pulmonary tuberculosis.

Brief mention is made of foreign bodies in the respiratory system and emphasis placed on the taking of roentgenograms in both anteroposterior and lateral positions in addition to making a fluoroscopic examination. Regarding the cardiovascular system, the size, shape, and position of the normal and pathologic heart, the condition of the aorta and pericarditis with effusion are described.

ADOLPH HARTUNG.

**Jackson, J. A.: The X-Ray as an Aid in the Reduction and Treatment of Fractures.** *Wisconsin M. J.*, 1918, xvii, 19.

The X-ray not only shows the line of fracture, but also the number and relative positions of the fragments. One should not rely entirely on this method of diagnosis to the exclusion of other means. Radiographs require careful study and not a mere glance. The roentgenologist must familiarize himself with the plates of normal bones and joints. This is especially true of complicated joints such as the carpus, the tarsus, and the spine and bones of

the skull. The surgeon himself should study the plate and familiarize himself with the interpretation.

There are two methods of examination, first, plates, and second, the fluoroscope. Whenever possible, especially in the smaller bones, it is well to make use of both methods. One should always take plates even though he is perfectly satisfied with the fluoroscopic examination. The plates are a permanent record in medicolegal cases or malpractice suits.

Two views at right angles to each other are of more value than stereoscopic plates. From the standpoint of economy and from the different angles from which one may view the case before, during, and after reduction, the fluoroscope is a wonderful aid. Most errors are made on account of poor or blurred negatives. Lengthening or shortening of the shadows are made by not having the tube centered over the part at an exact right angle with the plate.

J. J. KURLANDER.

#### HOSPITAL, MEDICOLEGAL, AND MEDICAL EDUCATION

**Finochietto, R.: North American Surgery in 1917** (*Cirugía nortamericana en 1917*). *Semana méd.*, Buenos Aires, 1918, xxv, 201, 230, 292.

Finochietto of Buenos Aires publishes his impression after a visit to some of the principal surgical clinics of the United States. He thinks that neurological surgery, anaesthesia, surgery of the thyroid, and nursing are the principal matters of interest which the United States offers to the general surgeon.

The operations reviewed under neurological surgery are: decompressions (craniotomy, etc.); treatment of various kinds of cranial fractures; operative treatment of essential hydrocephalus; epilepsy; cerebral and hypophyseal tumors; trigeminal neuralgia, traumatism of the brachial plexus, and spinal surgery.

The author criticizes the methods of Kanavel, Schroeder, Cushing, Sharpe, Landon, Dandy, Elsberg and Frazier. He notes that surgical operations for epilepsy are almost abandoned; that the nasal route for endocranial tumor is becoming more restricted in use.

In laminectomy no progress of any importance has been made.

The author describes cases of surgery of the thorax operated upon by Willy Meyer, Torek and Lilienthal.

At the Mayo Clinic, Rochester, Minnesota, the author saw only one gastro-enterostomy for cancer of the stomach. All other cases were resected. The early diagnosis and the radical treatment are not alone due to medical advance, but also to the better instruction of the people. The author calls particular attention to the complete abandonment of extensive removal of the stomach where a tumor is not situated very high in the small curvature.

In Chicago the author refers to an original form of operation by Davis in a rectal cancer in which the remnant of the iliac sigmoid is brought down to

the sacral region and discharges there, making a permanent fistula.

In cholecystectomies the author notes that Deaver and Eisendrath alone were seen to practice systematic catheterization of all passages.

In the treatment of uterine cancer the author refers especially to the advances made in the applications of radium both independently and in conjunction with surgery. He praises highly Howard Kelly both as a scholar and as a surgeon.

The clinics of Whitman and Sherman were visited. In Chicago the author saw cleft palates operated upon by Brophy. He thinks the Brophy

method owing to its simplicity will survive the Lane and Langenbeck methods.

For the operative treatment of infantile paralysis Finochietto thinks that the astragalectomy of Whitman is the operation of choice. It is done ten times more frequently than tendon transplantation.

The author refers to the method of auto-elimination of ureteral calculi practiced by Lespinasse of Chicago; the methods of diagnosis of ureteral stricture by Hunner and Richardson of Baltimore; also to recent operative measures in azoospermia by funiculo-epididymostomy. W. A. BRENNAN.

## MILITARY SURGERY

NOTE — Readers are referred to the Table of Contents for other articles dealing with military surgery which appear under the various headings according to our anatomical arrangement.

**Velter, E.: Penetrating Gunshot Wounds of the Cranium.** Paris: Maloine et Fils, 1917.

In the present war, wounds of the cranium are very frequent and unusually grave, notwithstanding the protection afforded by the helmet. The classifications so far proposed are unfortunately based on theoretic ideas acquired in civil life.

Some authors group penetrating wounds of the cranium according to the nature of the projectile: wounds due to bullets; wounds due to shell fragments; wounds due to fragments of bombs, grenades, and torpedoes. They deduce therefrom conclusions as to the operative indications (Vinay) and the prognosis.

Such subtle distinctions appear to be impossible in practice. On account of the multiplicity of projectiles during combat, the wounds are often difficult to differentiate, as they may be due to several kinds of projectiles. One must take into account also the projectiles which ricochet and deviate, as well as the deformed and jagged balls, which give rise to an infinite variety in the aspect of the wounds, and render impossible any precise distinction as to the nature of the vulnerating agent.

Other authors rely on the general symptoms, i. e., shock, coma, pulse, temperature, etc. (Rendu). The difficulty of judging the gravity of a wound, or of the necessity for intervention, from a consideration of the presence or absence of general and functional disturbances is evident when one recalls that some patients walk in by themselves with a compound fracture, and that others with slow pulse and all the signs of a grave lesion have nothing but a concussion, from which they recover in a short time. Moreover many factors foreign to the head trauma itself may markedly affect the functional signs, such as the noise and shock of explosions, fatigue from marching and running, exhaustion from loss of sleep, inanition and nervous depression following great exertion, and often the terror produced by the scenes of the battlefield.

The only rational classification is an anatomic one, though to establish it the knife is indispensable, for the external appearance of the wound is not characteristic and rarely enables one to judge of the extent or the exact site of the deep lesions. Surgical exploration is indicated in every wound of the head, even if apparently benign and superficial.

The varieties and subvarieties of penetrating wounds proposed have too often been of a schematic type which are rarely met with. Thus Abadie divides them into no less than 11 varieties: (1) chipping of the outer table; (2) cracking and displacement of the inner table; (3) hæmorrhagic focus; (4) complete depression; (5) complete depression, with impacted projectile; (6) comminution of both tables; (7) fracture with lesion of the dura; (8) fracture with intracranial projectile; (9) radiating fissures; (10) double perforation; (11) tangential grooves. Such an arrangement belongs to pathologic anatomy, not to clinical surgery.

Velter by a study of his cases is convinced that all these numerous types have several points in common, that all have the same operative indications, that they may be arranged in three or four groups at the most, corresponding approximately to what is found in practice.

Velter says: "From September, 1914, to November, 1915, I had charge of the service in cranial surgery in a hospital of the first rank a few kilometers from the firing line. The wounded were brought in from two to six hours after injury, by autos direct from the first aid stations to the hospital.

"To these excellent conditions of transport were added those of a permanent hospital, well located and thoroughly equipped, with everything at hand for operations of urgency under perfect asepsis."

His cases were collected before the use of the steel helmet came into vogue. They were caused by bullets, and by fragments of shells, etc., producing a great variety of lesions. He states that he did not



see a single penetrating wound from a cutting instrument.

He divides his cases as follows:

1. Penetrating craniocerebral wounds with great destruction (19 cases). These were very extensive lesions, with shattering of the cranium, laceration of the brain, and often fissures radiating to the base, wounds from large shell fragments, bipolar wounds by balls fired at very short distances, and penetrating seton wounds. Patients with these wounds were for the most part brought in dying; they were desperate cases, beyond all therapeutic resources.

2. Penetrating wounds of the cranium, without opening of the dura (18 cases). These were relatively benign wounds with a single orifice due to small fragments of shells or grenades, and ricocheting and fragmented bullets. In these all degrees of bone lesions may be noted from a simple chip of the outer table and ecchymosis to complete depression of the two tables with a projectile embedded in the opening. From an operative standpoint, this class is eminently favorable if operated upon in time.

3. Penetrating craniofacial wounds (5 cases). This interesting group is completely neglected by most surgeons. Their peculiarity is due to the presence of lesions of the orbits, nasal fossæ and accessory sinuses. Hence in addition to the question of cranial penetration, one often has to deal with an indication for ocular or orbital intervention.

4. Tangential wounds (5 cases). One of the most remarkable types,—furrows of the hairy scalp, scratches, superficial grooves or short seton wounds with the apertures very close to each other, without apparent damage, produced by bullets or by small fragments of shells or bombs, traveling at high velocity. While they appear benign and limited to the skin, they are always grave, by reason of the deceptive benignity, and on account of the presence of considerable osseous lesions (depressions, radiating fissures), and lacerations of the dura and the brain. It is in this class that detached fragments, the starting point for mortal accidents, are most often seen, sometimes deeply impacted in the cerebral mass.

5. Penetrating craniocerebral wounds, properly so-called. This group comprises the grave cases with opening of the meninges, more or less deep cerebral lesions, and the frequent presence of an intracranial projectile. Here again there may be wounds with a single orifice (fragments of bomb, grenade, shell, ricocheting bullets) or penetrating setons (usually by bullets). Velter divides forms which he has seen into three groups: (1) with occipital lesions and visual disorders (hemianopsia), 4 cases; (2) with lesions in other portions of the encephalon, 24 cases; (3) with deep lodgment of the projectile, 7 cases.

The immediate and early symptoms are extremely variable and not readily classified. However, they may be grouped as local, general, nervous, and ocular symptoms.

There are two essential points in the consideration of the local symptoms. From the standpoint of gravity, there is no relation between the local signs and the functional signs, and there is no certain relation between the aspect of the wound and the nature, the extent, and even the seat of the deep lesion. Hence it is necessary to explore from the beginning all head wounds, and not to be content with the superficial character, or the information from prudent palpation, and by exploration with a grooved director. This last is always advisable; it furnishes precise information, but it is not sufficient, and every wound of the hairy scalp should be uncovered and carefully examined in a good light.

With monoplegia there are complex symptoms dependent in general on a more or less extensive lesion of one hemisphere and compression of the other. The same phenomenon occurs for the two paracentral lobules as for the two cortical visual centers, e.g., a unilateral lesion by irritation or by compression (hæmorrhage) in the vicinity causes disturbances of the opposite side (double hemianopsia and transitory cortical blindness). It is in this way that the homolateral nervous symptoms may be explained, in general, for the cause which produces them is ephemeral.

This restriction being made, all the paralytic motor disturbances are of great importance in the localization of lesions. For the hemiplegias particularly, Velter quotes the conclusions of Guillian and Barré on the topographic diagnosis of traumatic lesions in the intracerebral tract:

1. Cortical lesions causing hemiplegias are more or less complete, and monoplegias often limited. There is also jacksonian, and occasionally general epilepsy, disturbed superficial and deep sensibility, variable state of the reflexes, and astereognosis, principally in cases of lesions of the ascending parietal and the anterior one-third of the adjacent parietal convolution.

2. Subcortical lesions produce total hemiplegias, rapidly spasmodic contractures, with clonus and extension of the toe, diminution or abolition of abdominal and cremasteric reflexes, with neither the superficial nor the deep sensibility disturbed.

3. Capsular lesions cause total hemiplegias, more or less intense according to the degree of lesions, with rapid tendency to spasmodic contractures and no disturbance of sensibility.

4. Lesions in the region of the gray nucleus and especially of the thalamus produce total hemiplegias as in group 3 above. They also cause painful sensory troubles, disturbed deep sensibility, astereognosis, chorea, athetosis, ataxia, and early contractures.

A simple clinical study of traumatic aphasia gives but very imperfect findings as to the cerebral localization of the aphasia, which can only be determined at operation. The complexity of speech disturbances is very great, and with the exception of a few very rare cases, it is impossible to classify them as either motor or sensory aphasia.



The existence of deep disturbances of the intelligence is almost constant; these involve especially memory, attention, the character of the individual, so much so that one cannot, so to speak, separate the study of the speech disturbance from that of psychic troubles.

The general character of hemianopsia in this class of injuries was very well described by Barbazan, a few days before war was declared, based on a study of cranial injuries in previous wars, especially the Russo-Japanese. It is necessary to call attention particularly to its development: (a) a phase of initial total blindness with complete disorientation, becoming manifest after the period of unconsciousness; (b) progressive retrocession, varying with the cases, of the visual trouble which localizes itself and then remains stationary; (c) in no case can one speak of a true cure nor of substitution, and this restriction applies as well to cases where the visual defect persists as to those where vision regains its integrity in all parts of the field; (d) progressive return of the perception for white, next of colors, is the usual phenomenon which shows the retrocession of the hemianopsia.

The form of the hemianopsia is extremely variable, as shown by the great diversity of types reported. But in the present war no example of superior horizontal hemianopsia has been recorded as yet. This corroborates Barbazan who writes: "It must be almost impossible in gunshot wounds of the cranium, for it can be produced only by such lesions as lead to immediate death." This region is the lower part of the occipital lobes with sinus and cerebellar lesions.

Is the visual acuity in hemianopsia normal when the macular field is preserved? Some cases show, in opposition to Barbazan's opinion, that there may be changes in the central visual acuity, even with absolute integrity of the fundus and preservation of the macular field in its entirety.

The diagnostic value of lumbar puncture in the initial period of the development of cranial wounds is inconstant. Hypertension is extremely variable; its degree is not always in relation to the nature of the wounds. The fluid also may be hæmorrhagic, or sometimes clear and normal, in spite of evident penetration of the cranium.

Surgeons who have carried out puncture systematically consider its results as doubtful; it is absolutely insufficient as a diagnostic measure; and whether positive or negative, it is always necessary to operate (Hartmann, Picqué, Leriche, Gayet).

In the postoperative period, on the contrary, lumbar puncture when frequently repeated, withdrawing medium amounts (10 to 15 ccm.), gives excellent results as an adjuvant to the operation itself against the secondary symptoms, e.g., rebellious headache, vertigo, dazzling vision, papillitis, and posthæmorrhagic meningeal reaction. As a rule, it has little effect on large hernia cerebri. In developing meningo-encephalitis, it often relieves the patient but cannot arrest the fatal progress.

In the late stage, lumbar puncture permits effective action on the painful functional troubles to which nearly all the cases of head wounds are liable; at this period the chemical and cytologic examinations are very important. Stubborn hypertension, persistent hyperalbuminosis and lessened lymphocytic reactions indicate latent lesions and necessitate the most reserved prognosis.

Cytologic examination, on which so many authors insist as a prognostic index, also gives uncertain results.

The operative indications may be stated thus: Trephine all wounds of the cranium systematically, those where penetration is doubtful, as well as those in which it is certain. Trephine at once, and at the front, i.e., close to the firing line. Operate freely, leaving nothing unexplored. Early intervention is the essential factor for success in cranial wounds, probably more so than in all other injuries.

The immediate prognosis of penetrating wounds of the cranium is very grave; according to numerous statistics, 55 per cent of the wounded die on the field.

Most of the wounded are brought in dead or dying, or live only for a few hours. Persistent coma, with rapid and irregular pulse, the crises of general contractures, extreme agitation, stertorous and Cheyne-Stokes respiration, are the signs of a fatal prognosis.

The operative prognosis depends on a certain number of conditions:

1. The anatomic variety of the fracture, and not the general or the nervous symptoms. The prognosis is particularly grave in bipolar fractures and in tangential wounds; in the latter, though apparently benign, the deep lesions are sometimes considerable. The prognosis is also very reserved in cases of intracerebral projectiles.

2. The state of the dura, which, from the standpoint of prognosis and that of treatment, divides cranial wounds into two groups: (a) with the dura intact, the wounds are not very serious, if operated upon early; (b) with the dura open, the wounds are serious with deep lesions, and danger of meningeal infection gives a high mortality.

3. The precocity of the intervention is important. Trephining is an operation of great urgency, for meningeal infection is extremely rapid. The deplorable results of delayed trephining are well known to surgeons at the front.

4. Asepsis should be as strict as for abdominal operations, if not more so, for the peritoneum reacts rapidly against infection and limits it by adhesions, while the meninges do not adhere rapidly and pathogenic germs quickly invade the subarachnoid spaces.

5. The technique must be well regulated, very prudent and very systematic; one step should not be commenced until the previous one has been finished; and hæmostasis must not be neglected. The smallest details are important, and one should be persuaded that in operations on the brain and meninges especially, the least inattention, the least negligence may give rise to catastrophes.



If the first steps of the operation (treatment of the cutaneous and osseous lesions) are easy, this is not the case with the further steps. The course to be pursued in lesions of the dura and the brain, the choice of the best method, the opportunity for surgical opening of the meninges, or, on the contrary, abstention, are points which call for much decision without temerity, and great practice in cranial surgery. In the same way exploration of a cerebral focus, extraction of bone splinters or projectiles deeply located call for a delicacy of touch and a surety of hand which can be gained by experience alone. It is only too commonly believed that trephining is always easy and harmless, and to be done by any surgeon. In cranial surgery there are things which one must know not to do.

Cranioplasty is not always a harmless operation; its principal danger is the lighting up of a latent infection. One need be in no hurry to operate, but should wait a long time and not decide unless during at least one year the patient has shown neither grave subjective nor organic nervous symptoms.

Cranial autoplasty is formally contra-indicated when there are changes in the cerebrospinal fluid,—hypertension, hyperalbuminosis; in such cases it will have directly the opposite effect to the one desired.

Cartilaginous autoplasty appears the most rational, and above all, the most constant in its results. The immediate surgical results are good, the aesthetic result and protection of the brain perfect; the late results are uncertain and sometimes bad.

By reason of the possible dangers and the still present uncertainty as to the indications for cranioplasty, it is impossible to insist on the wounded undergoing it, and their refusal to submit to it should not lead to any reduction of pension.

Velter gives the statistics of results in cranial wounds. He reports 84 personal cases. These include: penetrating wounds with great lacerations, no operation, rapidly fatal, 14; penetrating wounds operated upon elsewhere, 2; penetrating wounds with massive lesions, removal of fragments and dressing of wound, 5; penetrating wounds trephined, 62; cerebral abscess following a penetrating wound, 1.

Of these, 53 lived; 28 died (excluding the case of abscess); the total mortality was 33.7 per cent.

Of the 19 penetrating wounds not trephined, 1 lived, and 18 died.

The operative results in penetrating wounds, trephined, were as follows: cranial wounds with intact dura, 16; 1 death; craniofacial wounds, 5; 0 deaths; tangential penetrating wounds, 5; 0 deaths; penetrating craniocerebral wounds: (a) with hemianopsia, 4; 0 deaths; (b) with other encephalomeningeal lesions, 24; 8 deaths; (c) with deep-seated projectiles, 8; 1 death.

The total mortality was 16.1 per cent; the mortality of craniocerebral wounds was 25 per cent.

Late results gave: evacuated, 53; not traced, 4; early death, 1; late death, 2; still under treatment, 8; invalided, 27; auxiliary service, 6; again in ranks (one of these recently killed), 5.

Statistics of other authors are also given. Abadie did 172 trephinings; 71 died. There were 70 lesions of the skull alone, 14 of which died (20 per cent); and 102 lesions of the skull with opening of the dura, of which 57 died (56 per cent).

Bénard had a mortality of 50 per cent. Cunéo had a mortality in craniocerebral wounds of 60 per cent. Didier reported 64 craniocerebral wounds with 63 operations; 27 died. Froelich had 82 cases, 47 with lesions of the brain; 20 died (25 per cent).

Gayet in two series had (a) 198 operations; 76 died; in 22 the result was not known; 100 recovered; (b) 103 cases; 101 were operated upon; the mortality was 26 per cent.

Lapointe did 170 trephinings; the total mortality was 25 per cent. There were 7 bipolar wounds, 6 died; 25 deep foreign bodies, only 2 extracted; 14 died, 11 were evacuated to the rear; 48 deep penetrating wounds, 37 tangential; mortality, 56 per cent; 33 tangential grooved wounds, 16 died; mortality 45 per cent; penetrating wounds with intact dura; mortality, 13 per cent; depression of both tables, 7 cases, 2 deaths; tangential depression, 25 cases, 2 died; fissures, 9 (8 involved both tables); 0 deaths; isolated fracture of the inner table, 3 cases, 1 died.

Sencert had 234 operations, as follows: cranial wounds, 39; 2 died; craniocerebral wounds, 92; 42 died; tangential wounds, 48; 20 died; seton wounds of the cranium, 42; 30 died; bipolar wounds, 13; 8 died.

End-results gave: of 71 heard of, 24 deaths (usually during the first month) and 47 living, 10 still under treatment, 5 at the front again, 2 in auxiliary service, and 30 who have been invalided.

P. H. KREUSCHER.

**Balleuil, L. C., and Jack, W. D.: The Use of Fascial Transplants in War Surgery.** *Ann. Surg.*, Phila., 1918, lxviii, 1.

The type of case selected for fascial transplant has been variable. The method seems applicable to the whole field of plastic surgery for repair of muscle sheaths. The operation consists of 4 steps: (1) resection of the scar; (2) liberation of the muscle and the margins of the aponeurosis; (3) the cutting of the graft, its application and fixation; (4) reconstruction of subcutaneous tissues and skin.

The resection of the scar must be complete, including the cutting of fascial and muscle adhesions. The graft is cut from the fascia lata through a linear incision by undermining tissues. The graft is placed in a saline sponge. The fascia lata is closed with mattress sutures and the skin wound closed. The graft is then fitted into the defect left by the excision of scar tissue; it is fastened in place with No. 00 catgut sutures and the wound closed and the part immobilized. Fifty cases have been operated upon by the authors with uniformly perfect results: absence of infection, relief of pain, and improved function of the part.

LISTER TUHOLSKE.

**Smith, J. J.: Eye, Ear, Nose, and Throat Work at the Recruiting Depot.** *N. Y. M. J.*, 1918, cviii, 69.

The methods of instruction adopted by the medical department of the army as obtained before the war are given; it is shown that after a three months' attendance upon the lectures at the Army Medical School located at Washington, a man was commissioned and supposed to be ready to do any kind of medical or surgical work. This he says is all changed in the present system, in that the Surgeon General and his advisory board have called in large numbers of reserve doctors and assigned them to work in which they are extremely proficient.

For the guidance of the eye, ear, nose, and throat man who is located at a recruiting station, a set of instructions have been prepared, known as General Orders No. 66, 1910. These give in detail the requirements for the various arms of the service. It is presumed that these regulations are for general guidance in examinations to be made, as it is said that these regulations do not apply to drafted men, but were drafted for applicants for the old regular army. A recital of the requirements for drafted men is made as pertains to the ear, the eye, the

mouth, nose, fauces, pharynx, larynx, trachea and œsophagus.

In making an examination of some 21,000 men the author is able to set forth the following statistics regarding them: 25 per cent had septal deviations, of which 12 per cent were to the right and 13 to the left; 28 per cent had hypertrophied or diseased tonsils or both; 23 per cent needed throat operations; 25 per cent needed both nasal and throat operations. Many cases of retracted membrani tympani were seen, but a very inconsiderable number seemed to have lessened hearing therefrom. The greatest number of rejections were because of defective vision.

In conclusion the author is led to believe that with slight expense the recruiting depots could give the men the required surgical attention to place the eyes, nose, throat, and teeth in good condition and thereby save the expense of caring for a man who becomes incapacitated on the field of battle by reason of tonsillitis, measles, pneumonia, rheumatism, diphtheria, scarlet fever, sinusitis, mastoiditis, or other disease. He gives it as his opinion that many of these ills are directly traceable to some pathology about the head.

J. S. CLARK.



# GYNECOLOGY

## UTERUS

**Myers, L. L.: Radium in the Treatment of Carcinoma of the Uterus.** *J. Iowa St. M. Soc.*, 1918, viii, 246.

The author reviews the results of various methods of treatment, these including the simple vaginal hysterectomy, the radical vaginal hysterectomy of Schuchart, and the radical abdominal hysterectomy of Wertheim. He also points out the necessity for early diagnosis, presenting figures showing the incompetency of the average physician in diagnosing the condition. He concludes that all of the surgical methods are unsatisfactory, and then discusses in full the action of radium on the carcinoma cell.

These paragraphs serve as a very good review of the subject. The relative value of the  $\beta$  and  $\gamma$  rays is taken up, and also the exact method of the action on the cell. Dosage and technique are discussed at length, and a report of several cases is given in detail.

While the author's experience does not extend over sufficient time to make definite statements as to the outcome of the cases which he treated, he presents figures from other clinics proving his claim as to the superiority of the radium treatment over other methods.

W. A. EVANS.

**Brady, L.: A Sarcoma of the Uterus Arising from the Endometrium.** *Bull. Johns Hopkins Hosp.*, 1918, xxix, 164.

The patient, aged fifty-three, had been married thirty-one years and had had three children, all living and well. The labors were spontaneous and not difficult and there was no later trouble. She had ceased menstruating several years before, but for the six months previous had been having some bloody discharge from the uterus. She also complained of a small lump in her left breast. The uterus was about twice the natural size, regular in outline and freely movable. No pelvic tenderness was made out.

At operation the curettings showed sarcomatous tissue. A panhysterectomy was performed. The patient recovered nicely after an attack of malaria. The breast tumor proved to be a cyst.

When the uterine cavity was opened, there was seen a heart-shaped growth attached to the upper part of the fundus near the left cornu. The growth measured 4 by 5 by 4 cm. and felt quite soft. In fresh section the cut surface was homogeneous; the color white, mottled with a little yellow. Several large venous sinuses stood out plainly. The uterine mucosa seemed normal everywhere except at the point where the tumor had arisen. The tubes, ovaries, and cervix were perfectly normal and care-

ful measurements showed them not to be enlarged. There were no adhesions around the uterus, tubes, or ovaries. Sections showed sarcoma with many pigmented places.

EDWARD L. CORNELL.

**Gellhorn, G.: Malignant Syphilis of the Uterus.** *Interst. M. J.*, 1918, xxv, 506.

An unusual case of malignant syphilis of the uterus is reported in a young colored girl seventeen years old, in whom the syphilitic infection ran its entire course from the initial stage to a fatal ending in less than a year. The diagnosis was secured by finding spirochaetes in the secretion and in the tissues of an extensive ulceration of the cervix.

A point of unusual interest was the symbiosis of spirochaetes and gonococci in the tissues of the ulcer. Within two months this ulceration had changed into a large cauliflower tumor which histologically presented a clear-cut picture of gumma. In this stage the Wassermann test was negative, due to the fact that the marked and rapidly progressing cachexia of the patient prevented the formation of antibodies in the blood.

Antisyphilitic treatment was of no avail, and the patient died of a perforative peritonitis from a retroperitoneal abscess between the uterus and sacrum. The author thinks that this abscess was in all probability a gumma which had extended from the cervix through the parametria into the pelvic cellular tissue and had eroded large portions of the pelvic bones. Secondly microbes invaded this gummatous infiltration from the necrotic surface of the cervical tumor and brought about an abscess which eventually broke into the abdominal cavity.

After autopsy, numerous microscopical sections were made of the various infected structures, one of which showed a gumma in one of the ovaries.

Gellhorn thinks that the rapidity and intensity of the syphilitic process in this case was due to a particularly virulent strain of spirochaete, aided and abetted by a racial lack of resistance.

E. C. ROOS.

**Strick, E. J.: A Case of Congenital Absence of the Uterus with Anomalous Vulvovaginal Anus.** *Am. J. M. Sc.*, 1918, clvi, 75.

In May, 1915, a Chinese girl, aged twenty years, entered the Wilhelmina Hospital, Amoy, China, with the complaint that her menstrual flow came from the urethra.

Upon external examination it was found that the pubic hairs were scant, but this is usual among the Chinese. There was a complete absence of an anal opening at the usual site. The clitoris, labia, and urethra were normal. The vaginal opening was rather small and there was no trace of a hymen.

Upon internal examination no uterus could be felt, but a broad band could be felt in the pelvis stretching from side to side and sagging somewhat in the middle. On the right side near the pelvic brim there was a small gland-like object, about 2 cm. in diameter, in this band. On examining the posterior part of the cavity, it was found to be very roomy. There was no septum dividing the vagina from the rectum. The examining finger came in direct contact with feces in the rectum. By introducing a sound into the bladder and two fingers into the rectovaginal cavity, no uterus could be felt. The bladder seemed to be without defect. By the aid of a speculum the findings were confirmed and no further trace of a uterus could be found.

The patient's breasts were normally developed and she had a normal feminine voice and appearance. She was kept under observation in the hospital for about two months to determine whether it was a case of vicarious menstruation, but during that time no signs of menses appeared. EDWARD L. CORNELL.

#### MISCELLANEOUS

**Taussig, F. J.:** A New Operation for Urinary Incontinence in Women by Transposing the Levator Ani Muscle. *Am. J. Obst.*, N. Y., 1918, lxxvii, 881.

Taussig's procedure is based upon the argument that the sphincter muscle has been destroyed by disease or the traumatism of childbirth. It consists in transposing the anterior bundles of the levator ani muscle beneath the anterior vaginal wall and attaching the transposed portion under the urethral opening to the pubic ramus of the opposite side.

A U-shaped incision is made surrounding the urethra and extending about 3 cm. above and below it. A semicircular incision is also made at the junction of perineum and vagina extending somewhat higher on the right side.

The vaginal mucosa below the urethra is dissected off to form a flap and the vaginal walls dissected for some distance to either side to lay bare the peri-urethral tissue. Next the levator ani muscle is laid bare through the perineal incision. On the right side

it is exposed along its entire length. Then grasping a bundle of this muscle  $1\frac{1}{2}$  cm. in width, it is cut free from its rectal attachment and dissected loose from the main muscle bundle so that a muscular flap about 6 to 7 cm. in length is formed, still attached to its insertion in the white line.

The vaginal wall between the urethral incision and the perineal incision on the right side is then tunneled loose and a curved forceps passed from the urethral incision through this tunnel to grasp the bundle of levator muscle fibers and pull it through the urethra.

Three No. 1 thirty-day chromic catgut sutures attached the ends of the transposed muscle to the remnants of the trigonal fascia on the left side and the edge of the muscle is similarly attached by a suture to the right side.

The vaginal flap below the urethra is sutured to the inner edge of the U-shaped incision forming a urethral canal 3 cm. long, and the outer edges of the incision sutured over it to close the wound area and cover the urethral canal. A small retention catheter is left in the urethra and fastened by a silk suture.

The levator muscle on the left side which had been torn and somewhat reduced in size is now sutured to the remainder of the levator muscle on the right side and the perineal wound closed in layers in the usual manner with catgut sutures.

This operation was subsequently improved upon in this manner:

A large U-shaped incision extending 6 cm. above the urethra to the upper margin of the labia minora is made. The transposed muscle is exposed. Two purse-string sutures are passed around the urethra, picking up laterally the edges of the muscle and thus bringing the muscle up and around the urethra in a crescentic form. These sutures are tied over a metal catheter fairly snugly.

A new urethra 6 cm. long is built up from the inner layers of the labia minora. The remainder of the labia minora is trimmed off and the wound and new urethral canal covered up by drawing together with sutures the tissues at the junction of labia minora and majora. Again a retention catheter is fastened in place through the new urethra.

CAREY CULBERTSON.



# OBSTETRICS

## PREGNANCY AND ITS COMPLICATIONS

Lascano, M. G., and D'Atri, A. B.: A Rare Case of Abdominal Ectopic Pregnancy (Un caso raro de embarazo ectopico abdominal). *Semana méd.*, Buenos Aires, 1918, xxv, 235.

The case reported occurred in a woman forty years old. The pregnancy apparently began in August, 1913, and continued its course until May, 1914, when a discharge of blood, etc., occurred, and foetal movements then ceased. The woman had no trouble for some months following, but the abdomen remained distended and she consulted a physician who punctured her right side, drawing off a thick, bloody fluid. Menstruation was resumed a month later and continued for three months, when she was suddenly seized with pain in the anal region, and spontaneously expelled a large quantity of the same thick, bloody fluid. The abdomen resumed its natural size and the woman's general state improved and continued good for two years, although an irregular anal discharge continued. In July, 1917, after a particularly painful discharge had occurred, it was found to contain some particles of bone. Ten days later she passed a large foetal bone; a frontal bone followed some months later. She was then sent to the authors' clinic.

Rectal examination showed in the fundus a mass of about 10 cm. from which a purulent secretion issued. Rectal palpation of this mass discovered an opening in the right anterior wall about the size of a five-cent piece, with clearly defined edges about 4 mm. thick. The examining finger felt a bony mass pressing against the orifice which could be identified as a tumor about the size of an orange.

Intervention was made through the dilated rectum, the amount of dilatation obtained by the hand alone being quite sufficient for the extraction of the foetal bones. The cavity was curetted and treated with iodine. The whole operation lasted one hour. The woman made an excellent recovery.

According to the authors, the facts indicate that this was a typical abdominal ectopic pregnancy progressing to full term, as shown by the development of the bones, and that the foetal mass suppurated spontaneously into the rectum.

Although the abdominal route is generally advised in operating on such ectopic pregnancies, the authors preferred the rectal for several reasons, namely, the state of the patient, the fact that some bones had already been spontaneously expelled this way, that the thickened cyst wall was a protection during further extraction, and because the rectum could be fully dilated. Pozzi and Tarnier had followed this method in two somewhat similar cases.

W. A. BRENNAN.

Parke, W. E.: Cæsarean Section in the Treatment of Eclampsia. *Am. J. Obst.*, N. Y., 1918, lxxvii, 948.

Parke reports 21 cases of eclampsia in which the patients were delivered by abdominal section. In every case the operation was performed in addition to, or preliminary to, eliminative treatment. Two of these mothers and four of the babies were lost. These case reports are submitted in detail. As a result of this experience the author presents the following conclusions:

1. Since pregnancy is responsible for the eclampsia, its termination by one method or another is indicated as soon as a convulsion has occurred.

2. The interest of both mother and child is served by the same procedure, namely, early operation.

3. Each case should be considered on its own merits and that method of delivery adopted which best suits the case.

4. Delivery by the abdominal route is indicated in primiparæ where labor has not set in, or is not well advanced, where the child is living and viable, and the nearer the child is to term, the stronger the indication. Multiparæ at or near term, but not in labor, and with rigid and high-placed cervixes, may well be included in this group.

5. The contra-indications for the cæsarean operation are repeated vaginal examinations, examinations continued over a long period, more particularly where the bag of waters has been broken, where unsuccessful attempts at delivery have been made, and where there is any infective process in the birth canal.

6. Operations through the abdomen are attended with more risk than operations through the birth canal if done under unfavorable conditions, hence a suitable environment and a capable operator and assistants are necessary for this method of delivery.

CAREY CULBERTSON.

Trout, H. H.: Cæsarean Section; Local Anæsthesia. *Surg., Gynec. & Obst.*, 1918, xxvii, 95.

It is interesting that while an increasing number of abdominal operations are being done with the use of local anæsthesia, cæsarean sections, except in few instances, are not being done by this method.

There is very little pain to the operation, only when the uterus is lifted out of the peritoneal cavity; there is no pain on incision of the uterus.

The eighteen cases prove Lennander's contention relative to the sensibility of the various viscera and parietal peritoneum.

Often where cæsarean section is indicated, a general anæsthesia is contra-indicated, chiefly in eclampsia, when local anæsthesia is almost ideal.

The author introduces sutures into the uterus before incision is made into the same, and then after the incision these sutures are tied across the incision so as to give double locking mattress sutures, which not only approximate the surfaces, but control the hæmorrhage at the same time.

The three maternal deaths in eighteen cases were all with eclampsia, and in all three, delivery had been attempted with forceps before the operation.

The author feels where the condition of the mother makes the giving of a general anæsthetic unsafe, the employment of novocaine is indicated, and its use does not present the difficulties one would naturally expect.

**Novak, E.: Rupture of the Uterus Through the Cæsarean Section Scar.** *J. Am. M. Ass.*, 1918, lxxi, 105.

The author reports the case of a white woman, aged nineteen, who had had a cæsarean section performed May 5, 1916, the indication having been intrapartum eclampsia. At about the expected date of confinement, July 15, 1917, the patient went into labor. Her own statement as to this confinement is that there were only two or three typical labor pains, these being followed by severe and constant pain over the entire abdomen, associated with some rigidity of the abdominal walls. This diffuse pain persisted for three days, being accompanied by a fever ranging from 99 to 101.5° F., and by a slightly accelerated pulse, never higher than 100.

After the subsidence of the pain on about the fourth day, the patient was able to get around fairly comfortably, but she remained in the hospital awaiting the reinauguration of labor. No foetal heart sound was to be heard after this spurious labor, nor did the patient perceive any foetal movements. On August 29 the abdomen was enlarged to the size of a full term pregnancy, the walls being quite rigid so that the foetal parts could not be mapped out. No foetal heart sounds were heard. On vaginal examination no presenting part could be felt, the cervix being closed and fairly firm, not resembling in feel the cervix of pregnancy. In view of the rather clearcut history and of the foregoing findings, only one diagnosis seemed possible, that of rupture of the uterus with extrusion of the foetus into the abdominal cavity.

At operation, just above the umbilicus a thick, spongy tissue was encountered, which on extension of the incision, was found to be the placenta. A few centimeters above the placental area, the amniotic sac was entered. About two quarts of clear amniotic fluid escaped. A large, partly macerated foetus was found lying in the abdominal cavity in an oblique position, the head being above and to the right under the dome of the diaphragm and the extremities extending downward and to the left. The amniotic sac was intact except where it had been incised on the opening of the abdomen. The uterus had undergone involution after rupture, being

about the size that one would expect six weeks post-partum. The anterior wall of the uterus had been split asunder through the line of the old incision, the rift extending from the fundus to about the level of the internal os. The right ovary was thoroughly disorganized through cystic degeneration, being about the size of a pullet's egg.

A subtotal hysterectomy was performed, the left ovary, which was normal, being conserved. On removal of the uterus, together with the attached placenta, umbilical cord and foetus, an enormous cavity was left. The walls of this were formed in a general way by the parietes anteriorly and by the adherent coils of intestine above and behind. It was a beautiful illustration of foreign body encapsulation. The inside of the cavity was lined by tightly adherent amniotic membrane, which was removed where this was possible. The large cavity left on the removal of the foetus was then marsupialized, several large cigarette drains being introduced in various portions and then brought out through the abdominal incision. The latter was closed in tiers in the usual manner, being reinforced by a number of interrupted silkworm-gut sutures. Recovery from the operation was uneventful, the patient being discharged from the hospital three weeks after the operation. EDWARD L. CORNELL.

**Morinelli, V.: Obstetrical and Gynecological Sequelæ of Cæsarean Section** (Porvenir obstétrico y ginecológico de la mujer cesareada). *Semana méd.*, Buenos Aires, 1918, xxv, 612.

The author gives short clinical histories of 140 cases of cæsarean section in the maternity hospitals of Buenos Aires, and concludes that the prognosis of classical cæsarean section in uncomplicated aseptic cases is about equal to that of laparotomy in non-inflammatory cases. In Buenos Aires the mortality is 5.5 per cent.

In suspicious cases in which the technique varies and the operation is deferred, the prognosis varies for different operators, and the mortality rises to 13 per cent. In such deferred operations it is to be particularly noted that uterine parietal adhesions are very frequent and inevitable, and may incapacitate the patient for her previous occupation. Besides, there is greater danger in future pregnancies on account of the scar.

Cæsarean section ought not to be employed in infected cases. Only the extraperitoneal operation of Latzko-Döderlein is permissible when the life of the child is not compromised, or Sellheim's uterine marsupialization or the Porro operation.

When the pelvic and foetal disproportion is not very great and the vaginal canal does not offer serious obstacles to the passage of the foetus, symphyseotomy ought to be preferred to cæsarean section for the reason that when conditions make a symphyseotomy practicable, the moment of choice for the classical cæsarean has passed.

The technique of symphyseotomy is extremely simple; anæsthesia is obtained in a few minutes;



there is no necessity for an assistant; the operation can be done in the patient's home; and the mortality and morbidity are less than that of the delayed cæsarean.

Judging from his statistics, the author thinks that suture in three planes for the uterine wall gives the best results.

It is logical to perform a hysterectomy in the second cæsarean unless the patient makes a request to the contrary, but the author thinks hysterectomy should always be done in every delayed cæsarean or if the patient is syphilitic, tubercular, or shows nephritic or cardiac derangement.

The author gives short particulars of the 140 cases reported.

W. A. BRENNAN.

**Chiaje, S. D.: The Technique of the Cæsarean Operation** (Osservazione sulla tecnica del parto cesareo). *Riforma med.*, Napoli, 1918, xxxiv, 302.

Chiaje's experience is based on 16 cæsarean sections done in his clinic. He prefers to intervene primarily before the onset of labor, as this time seems more rational and the statistical results are better. In 13 cases so treated, there was no death either of mother or child. He does not think that a few days' shortening of intra-uterine life seriously affects the foetus. In 12 cases in which the membranes were ruptured at the beginning of the ninth month, in only 3 did the foetus weigh less than 2,900 gr., and in 6 it exceeded 3,000 gr.

He thinks disinfection of the patient ought to be confined to the abdomen as in any laparotomy. The horizontal position rather than the Trendelenburg is preferred as the danger of an embolism is avoided. The uterus is exteriorized before incision, an injection of ergotin or pituitary extract being first made in the wall to secure its muscular tonicity.

The author discusses the Fritsch, Sanger, and Caruso incisions. He thinks that the Fritsch incision exposes to the danger of utero-intestinal adhesions. A combination of the high incision of Sanger and the sagittal incision of Caruso is best, in his opinion, and he used this in 14 of his cases. Some of these, which were repeated cæsareans, did not show any weakening of the old scar. The incision was made on the median line corresponding to the so-called linea alba of the uterus, commencing the section from the anterior wall and progressing toward the fundus so that two-thirds of the incision involved the anterior face and one-third the tissue of the fundus.

In the author's cases the placenta was met between the margin of the section 4 times, i.e., 27 per cent. When the placenta is met beneath the section the author follows Tornier's plan. This consists in sectioning the uterine wall, introducing the extremity of the index finger between the muscle and the maternal surface of the placenta, and while the placenta is herniated through the orifice, the membrane is easily reached and ruptured. This maneuver was practiced in his 4 cases without endangering the life of the foetus.

W. A. BRENNAN.

**Danforth, W. C.: Results of Blood-Pressure Observations in 447 Cases of Pregnancy.** *Am. J. Obst.*, N. Y., 1918, lxxvii, 927.

The author makes no attempt to add anything new to the observations already recorded relative to blood-pressure in pregnancy, desiring merely to contribute another series to the literature of the subject.

In 332 of these cases blood-pressure readings were made upon entrance of the patient into the hospital and immediately after labor. In 115 cases a total of 608 observations were made, the number in individual cases varying from one to seventeen. The ages of these women varied from twenty-two to forty-three. Danforth combined the blood-pressure and urine examinations monthly until the last month, after which they were made weekly.

His conclusions are set down as follows:

1. The average blood-pressure of the pregnant woman is less than that of the non-pregnant.
2. Labor causes in many cases a rise of arterial tension.
3. Toxæmia of pregnancy is accompanied by a rise of blood-pressure except in very rare instances and this rise usually precedes other symptoms.

CAREY CULBERTSON.

## LABOR AND ITS COMPLICATIONS

**Chneerson, M.: Extract of the Posterior Lobe of the Hypophysis in Obstetrics** (De l'extrait de lobe postérieur de l'hypophyse en obstétrique). *Arch. mens. d'obst. et de gynec.*, Par., 1918, vii, 22.

The author has used extract of the posterior lobe of the hypophysis in 178 obstetrical cases either to hasten dilatation or in the course of expulsion. Her experience with the extract has led her to adopt it in all cases in which labor is either arrested or protracted. Its contra-indications are:

1. Uterine. Uterine cicatrices and rigidity of the cervix.
2. Pelvic. Situation of the head above the superior strait, and more especially any exaggerated disproportion between the size of the head and the pelvic outlet.
3. Maternal. Cardiopathy hypertension, arteriosclerosis, etc.
4. Fœtal. Surgical means are to be preferred if signs of fœtal suffering are manifest during labor.

The chief action of the extract of the posterior lobe is to provoke contraction of the smooth muscle fibers, especially that of the gravid uterus and bladder. The typical obstetrical dosage is 0.20 gr. of dry substance. It can be injected subcutaneously or (after dilution) intravenously, and may be repeated. It has no toxic action either for mother or child. The indications for its use are failure of the uterine contractions.

In simple uterine inertia the author obtained success in two-thirds of the cases. In slow labors with ruptured membranes even better results were obtained (in 88 per cent). In vicious presentations the

extract is a most valuable agent, as it has given 100 per cent good results in face and breech cases.

The extract seems to be less effective in cases of twin pregnancy and dystocia due to contracted pelvis unless this latter is slight.

In hæmorrhage during the course of labor the extract has been successful in four-fifths of the cases. The best indication is a lateral insertion of the placenta with artificially ruptured membranes.

Hypophyseal extract gives the most remarkable results during the expulsive period (96 per cent successes). It does not provoke labor and it is only partially useful in hastening delivery. Although not suitable for provoking abortion, yet it is useful in the evolution of an abortion. In placental retention it is almost useless.

In postpartum urine retention the action of the extract is sure and rapid (88 per cent success).

W. A. BRENNAN.

#### PUERPERIUM AND ITS COMPLICATIONS

**Mazzini, E.:** *Blood Culture in Puerperal Fever* (La hemocultura en el puerperio febril). *Rev. méd. d. Rosario*, 1918, viii, 171.

The author reviews and discusses the work of previous investigators of blood culture during the

course of puerperal fever. In 15 cases investigated by him there were positive results in 6 and negative in 9 cases. In 2 cases the hæmolytic streptococcus was found; in 2 the staphylococcus, associated with the bacillus coli in 1 case; the bacillus of Eberth was found in one, and associated with the staphylococcus in another. There were 3 deaths.

The author finds that the clinical examination of a puerperal patient is alone insufficient to formulate a diagnosis and prognosis. Blood culture in febrile puerperal cases is important and practically necessary for diagnosis and prognosis. It ought to be systematically carried out in all such cases. It should always be accompanied by bacteriological examination of the lochia. Clinical examination is also important in confirming the prognosis formulated from blood culture in infected puerperal cases.

The development of numerous colonies of virulent pathogenic organisms and their increase in successive cultures indicates a fatal prognosis. The author thinks that the hæmolytic streptococcus appears to be the most fatal agent associated with puerperal infection.

Blood culture alone does not provide sufficient evidence for a definite prognosis.

W. A. BRENNAN.



# GENITO-URINARY SURGERY

## KIDNEY AND URETER

**MacKenzie, D. W.:** Vesical Symptoms in Renal Disease; a Preliminary Report from the Department of Urology, Royal Victoria Hospital, Montreal. *Canad. M. Ass. J.*, 1918, viii, 611.

It is well recognized that frequent, painful urination, hæmaturia and pyuria are among the symptoms of renal disease; but that one or more of them may be the only subjective signs does not seem to have received sufficient recognition by the profession in general.

The reason the author again brings up this subject is due to the fact that many of his patients had had prolonged courses of irrigations for so-called cystitis and some of them were operated upon one or more times by suprapubic cystotomies for supposed surgical conditions of the bladder, when in reality the patients were suffering from some infection of the higher urinary tract. The renal conditions which are most frequently the cause of vesical symptoms are: tuberculosis, pyonephrosis, pyelitis, and renal and ureteral calculi. These various conditions are discussed in detail.

In discussing his cases of renal tuberculosis the author lays much stress upon the fact that all of his cases had bladder symptoms and some of them gave a history of bladder irritation for four years. All of his cases of pyonephrosis complained of frequent urination with pyuria and several were treated for cystitis or prostatitis.

MacKenzie believes that every case of pyelitis is accompanied by more or less cystitis, although not every case of cystitis is accompanied by pyelitis; and he feels that the majority of cases of cystitis will be found to be the result of renal infection. This he thinks is especially true of the wall, where, with the exception of those infections localized to the base of the bladder extending from a urethritis, or resulting from local irritation, urinary obstruction or trophic disturbance, a pyelitis may be demonstrated in every case.

Most, if not all, patients with renal calculus give a history of frequent urination with more or less pyuria, and many of them are treated as cases of cystitis.

Ureteral calculus located in the lower ureter generally gives symptoms of bladder irritation, and the pain from any ureteral calculus may be referred to the bladder, scrotum, or thigh. When the stone is lodged in the vesical portion of the ureter, the pain is often referred to the neighborhood of the bladder neck, and the vesical irritation may be present.

No so-called cystitis should be regarded as such without a careful exclusion of possible renal infection.

An analysis of 136 cases from the Department of Urology of the Royal Victoria Hospital is given, of which 109 complained of bladder symptoms. The following renal conditions were found: renal tuberculosis, 13; pyonephrosis, unilateral, 5, bilateral, 2; bilateral pyelitis, 6; hydronephrosis, 2; renal calculus, 4; ureteral calculus, 9; ureteritis from calculus, 4; tumor, 2; double ureter, 2. The paper concludes with the routine methods of examination as employed in the Royal Victoria Hospital.

H. L. KRETSCHMER.

**Eisen, P.:** Roentgen Examination of Kidney Tumors. *Illinois M. J.*, 1918, xxxiv, 14.

In examining patients who have a tumor or enlargement of the kidney the roentgenologist has at his disposal three different ways of applying the X-rays to aid in the diagnosis:

1. Direct examination of the tumor by means of roentgenograms which may show the tumor outline and foreign substances contained therein.

2. Visualization of the renal pelvis by means of injecting into the same substances giving opaque shadows and noting the changes in the configuration of the pelvis of the kidney due to the tumor.

3. Introducing shadow-producing substances into the gastro-intestinal canal, to bring out the displacement of these organs by the tumor.

The third method should be controlled by fluoroscopic examination; in the other two the latter has proven unreliable. The roentgenogram should in all three instances be made stereoscopic. To complete the roentgen examination, the renal pelvis of the removed tumor should also be injected and the stereograms studied. One should never fail to produce a roentgenogram of a tumor before injecting any foreign substance either into the pelvis of the kidney or into the intestinal tract, because the shadow produced by these substances may overlap other less distinct shadows due to disease of the kidney. In doing so one may detect stones in pyonephrotic sacs, calcareous deposits in tuberculous areas of the kidney substance, and calcareous glands.

The second method, that of injecting the pelvis of the kidney with a visible solution in suspension, is carried out after placing a catheter, visible in a roentgenogram, in the ureter of the affected kidney. Pyonephrosis with stones and fistulæ were demonstrated by injecting bismuth paste through the latter.

The third and not less valuable method of examining kidney tumors is by visualizing the gastro-intestinal tract either by a meal or enema and noting, first, its relationship to the tumor as far as displacement, fixation, and extension of the growth are

concerned, and also ruling out any gross pathological changes in the intestinal canal itself.

By combining the first with one or both of the other methods, valuable diagnostic contributions are obtained and additional information received as to the best methods of procedure at operation.

In the original article the author demonstrates a number of roentgenograms. THEO. DROZDOWITZ.

**Caulk, J. R., and Greditzer, H. C.: Occluded Renal Tuberculosis; Autonephrectomy.** *Med. & Surg.*, 1918, ii, 453.

In 1915 the authors reported five cases of occluded renal tuberculosis. Since then three more cases have been observed, also four cases of autonephrectomy due to stone, and two cases occurring in combination with cancer of the bladder.

The process of autonephrectomy is a result of changes in the kidney pelvis or ureter, especially the latter, so that no urine reaches the bladder from the affected side. The more frequent types of kidney pathology are a small contracted kidney with inspissated cavities and considerable fibrosis or a pyonephrotic bag. If obliteration of the ureter occurs high up, the lumen remains patent to this point, but if low down, the lumen is impervious and the ureter may be dilated or later become narrow and cord-like.

Occlusion may also take place in an integral part of the kidney, half of the organ undergoing autonephrectomy, and the remainder of the kidney secreting urine containing no microscopical evidence of disease. Whether the affected kidney will be large and distended or small and atrophic depends upon the number and location of strictures and the time when occlusion becomes permanent. One group may exhibit tumor of the kidney region, while another group may show no tumor and yet harbor extensive renal disease. The kidney may be of the small atrophic putty type, occasionally an abscess may form and rupture, involving the perinephritic tissue and burrow down along the psoas muscle into the groin, simulating psoas abscess as in Pott's disease. This condition presents great difficulties of diagnosis.

Smirnov has grouped these cases into three classes: (1) The bladder is tuberculous on the side of the affected kidney and a tumor of an immense size is found. The catheter will not pass through the ureters. (2) The bladder is normal; one ureter is impassable to the catheter and on this side a tumor is found in the kidney region. (3) The bladder is the site of advanced tuberculosis; cystoscopy is impossible on account of the ulcerated and contracted condition of the bladder mucous membrane. An enlarged kidney may be palpated and here error frequently arises, as this may be the healthy hypertrophied kidney while the affected one is small and atrophic. Several varieties not included in any of these classes have been observed. The bladder shows evidence of tuberculosis, or is clean with both ureters patent. Subdivisions of this group

are: (a) uninfected urine secreted from the affected side; (b) no urine secreted from the affected side.

Occluded renal tuberculosis presents no characteristic symptoms. The symptoms present are generally those of bladder affection, such as frequency, tenesmus, urgency, hæmaturia, and pain coupled with pain or tumor in the kidney region; the latter is by no means always present. Cystoscopically the bladder may show evidences of tuberculosis, but often appears normal except that in the region of the affected side the ureteral orifice is replaced by a scar.

Renal function tests often give the only clue to diagnosis. The phthalein test is always above normal, often doubled on the unaffected side. Chromocystoscopy is also of value in that it will show high colored dye from the normal ureter and nothing from the affected one. The authors summarize the eight cases of autonephrectomy due to tuberculosis as follows: 4 females and 4 males, ages ranging from thirty-two to fifty years; the right side was involved 5 times, the left 3. The kidney was palpable in one case. All were diagnosed during life except one which was complicated by extensive carcinoma of the bladder, making cystoscopic examination impossible.

The urine was clear in all but two cases. The bladder showed evidence of tuberculosis in 4 cases, chronic cystitis in 3 cases, and carcinoma in one. The ureters were patent in 3 cases, and obstructed in 5 cases, 4 at the bladder; in one there was no evidence of ureteral orifices at all; in the other, the upper ureter was just below the renal pelvis.

The authors are of the opinion that although the literature reports comparatively few incidences of tuberculous renal occlusion, it is much more frequent than is supposed. If the various diagnostic methods are utilized, such as ureteral catheterization, comparative functional tests, pyelography and chromocystoscopy, and careful study of the patient's previous history is made, such a complication of renal tuberculosis will be found much more frequently and will explain many of the so-called healed tuberculous kidneys. H. G. HAMER.

**Pazos Varela, R.: Complete Postoperative Anuria After Nephrectomy in a Case of Solitary Kidney** (Anuria completa post operatoria por nefrectomia en un riñón único). *An. de Fac. de med.*, Lima, 1918, i, 125.

This interesting case occurred in a girl of sixteen years in whom palpation discovered an enormous fluid tumor in the right lumbar region. There was frequent miction and considerable polyuria. Tuberculin reaction was positive. There was also some hæmaturia. The diagnosis was tuberculous pyelonephritis. Catheterization of the right ureter was easy; but it was impossible to discover the left ureteral orifice. A permanent sound was therefore left for 10 hours as it was thought the urine could be separately collected in this way. From the results of the examination of the supposed



separate urines thus obtained, intervention on the right kidney was decided on. The right kidney was found to be of immense size; its urine was purulent and slightly bloody; it appeared completely destroyed and a calculus blocked the ureteral opening. Nephrectomy was done.

The immediate results were good. There was anuria but this was not considered as unusual until it had persisted for forty-eight hours and the patient showed disquieting symptoms. As cystoscopic examination could not discover a left ureteral orifice, the author decided to make a lumbar exploration of the left kidney, but failed to find one. The case was one of a single kidney. The patient passed four days in apparently very good condition. The pulse remained firm; temperature  $36.5^{\circ}$  to  $36.8^{\circ}$ . There was moderate perspiration. On the sixth day the quantity of urea in the blood was fifty centigrams to the liter. Up to the twelfth day there were no signs to intimate the gravity of the condition. Then suddenly vomiting appeared, the pulse jumped, the facies became anxious, there were slight convulsions, and a coma lasting about six hours followed by death.

The case is interesting not alone from the point of view of the solitary kidney which was not diagnosed, but also because hydronephrosis in a single kidney is rare; moreover, hæmaturia in a hydronephrotic kidney appears unusual. Albarran in his treatise only mentions 12 cases found in literature. The long duration of the anuria, twelve days in this case, is also very interesting. W. A. BRENNAN.

**Vaughan, W. T.: Adaptations of Renal Function Tests for General Use.** *J. Lab. & Clin. Med.*, 1918, iii, 531.

There is an abundance of information on which to rely for interpretation of results and in modern hospitals kidney tests are performed on all cases where function is in question. In some hospitals the phthalein test is routine on all patients.

Modifications as simplified render the newer methods adaptable to an office practice. It is important to recognize other conditions which form a direct etiology for kidney damage.

An outline for a complete examination of renal efficiency applicable to private practice embraces:

1. A complete routine physical examination, including (a) cardiac borders and sounds; (b) arterial tension; (c) throat, tonsils, thyroid; (d) anæmias.
2. Blood-pressure, including (a) systolic for heart power; (b) diastolic for peripheral resistance. Diastolic above 100 mm. is pathologic. Systolic above 160 in a young adult is abnormal; it disqualifies for active U. S. Army service.
3. Ophthalmoscopy, a knowledge of the vascular as well as the nervous system.
4. Single fresh urine specimen.
5. Mosenthal's test; this shows the earliest and slightest degree of damage in chronic nephritis. Casts are a direct indication for the performance of the test.

6. Phenolsulphonephthalein test. The author describes a brief technique and states that for two hours normally 60 per cent should be present in the urine. An output of 40 per cent or less indicates a moderately advanced nephritis. Severity varies directly as the percentage of output. A 10 per cent output presages a prognosis of months or less. Cases have been known to live six months with no dye excretion. In chronic passive renal congestion due to cardiac decompensation the excretion is much delayed. Hyperpermeability evidenced by an excretion of 80 per cent indicates a hyperirritable condition of acute nephritis and earlier stages of chronic, following the acute form. As chronic nephritis progresses, the curve rises and then falls, hence the erroneous conclusions possible from a single test and the advisability of the two-hour renal test. An excretion of 80 per cent will occur occasionally in normal individuals. In some cases the excretion is low and will be found to improve with the improvement in the disease itself.

7. Ambard test. McLean's index of urea excretion and blood urea nitrogen content. The amounts of urea nitrogen in the circulating blood and in the urine being determined, the rapidity and effectiveness of excretion expressed in terms of a coefficient corresponds quite accurately in nearly all cases. The urea excretion test should be made by a trained laboratory man when there is impending uræmia.

8. Therapeutic test. The patient is put on Karrell's diet, 80 ccm. of milk in four portions at four-hour intervals. Five grain doses of theocin are given three times a day. This causes a profuse diuresis in cardiac decompensation, mediastinal tumor or cirrhosis of the liver, but in acute nephritis the excretion may even decrease. The classification by the laboratory methods is functional rather than anatomical. Since pathologists are still disputing the character of renal lesions at autopsy, it is well for the internist not to describe the kidney lesions from examination of the living subject.

H. W. PLAGGEMEYER.

**Pirondini, E.: Examination of the Renal Function in Boyhood and Adolescence** (Contributo all'esame della funzione renale nella puerizia e adolescenza). *Polisclin.*, Roma, 1918, xxv, sez. chir., 230.

Pirondini draws some conclusions from observations of experimental azoturia in young boys and youths, both normal and with lesions of the kidneys. He finds that from the sixth to the tenth year there is a higher elimination of urea per kilogram of weight than in the adult; and that this high elimination compensates for the low body weight. From the tenth year on, the elimination per kilogram tends to diminish according as the body weight and the renal mass increase. Low body weight therefore has little influence on the results found in experimental azoturia. These findings agree with the data already obtained by Baul, Garrot, Monfet

and Uhle. Another conclusion, a corollary of the above, is that the diagnostic and prognostic deductions drawn from experimental azoturia in individuals ranging from eight to fifteen years will not differ very greatly from those in adults.

W. A. BRENNAN.

**Frissell, L. F., and Vogel, K. M.: The Value of Tests of Kidney Function.** *Arch. Int. Med.*, 1918, xxii, 55.

The four general principles involved in kidney function tests are stated as follows:

1. The determination of the rate of excretion in the urine of a known amount of a chemical substance, injected or ingested.

2. The determination of the degree of retention in the blood of various normal metabolic products.

3. The comparison in a patient on a known test diet of the ingestion and excretion of nitrogen, sodium chloride, water, etc.

4. The determination of the ratio between the concentration of various metabolic products, ordinarily urea, in the blood, and their excretion in the urine, the result being expressed as a ratio of excretion or coefficient.

A brief discussion of these four principles then follows.

During the past three years, numerous observations covering the various forms of renal functional tests have been made in the chemical laboratory of St. Luke's Hospital. The records show 124 cases of nephritis, including over 1,500 separate tests, in most instances covering the complete series of analyses; that is, determination of McLean's index, phenolsulphonaphthalein excretion, urea nitrogen, and non-protein nitrogen. After rejecting those cases in which the disturbance was purely cardiac, with congested kidneys, and also such conditions as pernicious anæmia, pneumonia complicating nephritis, etc., there was left a series of 112 patients with pure nephritis upon whom over 1,400 observations were made.

An attempt was made to follow up the patients and find out the present condition of all who left the hospital alive. Of the 112 persons with nephritis showing findings of abnormal kidney function, sixty-nine, or 61.6 per cent, died in the hospital or after leaving the institution. Twenty-four, or 21.4 per cent, were still living in varying conditions of health; while nineteen, or 16.9 per cent could not be traced. In general, the results given by all these tests are strikingly consistent, and the high percentage of fatal cases, 61 per cent in a series of 112, is in accord with the indications furnished by the functional tests.

An effort was made to record graphically the course of renal function from the first observation to the time of death in the series of 69 fatal cases. These curves show a striking consistency. Where the observations are sufficient in number the renal function test may be of real value from the point of view of prognosis.

Another chart shows the graphic curves in 43 living cases, based upon 450 determinations. Three other charts illustrate the variations in functional values in interesting individual cases. The original paper must be consulted in order to form an estimate of the method and its value and limitations. Extensive tables accompany the paper, giving the detailed results of the examination in each case.

The following conclusions are appended:

1. The kidney functional tests have a real prognostic value, particularly if the results are constantly abnormal on repeated examination.

2. The higher values for the blood retention products are found mainly in the terminal stage.

3. By plotting the curve of a very long series of cases it should be possible to arrive at an average expectation of life as indicated by any individual examination.

4. The value of diet and drugs may in the future be shown more clearly by these methods than by any other now available.

H. A. FOWLER.

**Bell, W. B.: A Method of Dealing with the Divided Ureters When Implantation into the Bladder Is Impossible, or When That Viscus Is Absent.** *Lancet*, Lond., 1918, cxciv, 838.

This paper takes into account the serious problem of what to do with the ureters which cannot be implanted into the bladder either because they have been divided too far away or because there is no bladder in which to implant them. The author states that implantation of the ureters into the intestinal canal which is swarming with bacteria is the very essence of unscientific surgery. The following operation is devised that the operability of carcinoma of the cervix might be extended.

The technique of the operation involves a two- and possibly three-stage operation. At the first operation a median suprapubic incision is made; the anterior branches of the internal iliacs are tied, and an eighteen-inch loop of the ileum with its mesentery is isolated and anastomosis made to carry on the function of the intestinal tract. The apex of the isolated loop of bowel is superficially attached to the fundus of the bladder, and the two ends of the loop are brought out through stab wounds on either side of the abdomen and fixed in position. The central incision is closed. There will be some drainage, especially from the distal end of the bowel, and precaution should be taken against contamination. Postoperatively the loop of bowel is washed twice daily with 1:30 solution of Milton's fluid. Within ten days the isolated loop is practically sterile, and when the cultures are negative the next step is undertaken.

At the second operation a self-retaining catheter is placed in the bladder to be left for seven days. The abdomen is reopened and the loop of bowel is detached from the bladder. The ureters are divided at the pelvic brim and implanted into the isolated loop of bowel by the Stiles method. The whole diseased pelvis is then cleared with a large portion of the



base of the bladder, every vestige of the malignant condition being removed widely. Because the blood supply is cut off, this can be rapidly done. The remaining portion of the bladder is closed with two layers of catgut, and the apex of the loop of bowel is anastomosed with the highest portion of the remaining bladder. The ends of the bowel may be closed at this time or left open for lavage, in which event a third operation will need to be performed for closure.

This method may be modified to meet the exigencies of any case. In ectopia vesicæ an opening in the rectus muscle after the manner of a gastrotomy might be more satisfactory. The main point established is that a loop of bowel isolated in the living subject can be quickly rendered sterile and kept so.

P. W. SWEET.

### BLADDER, URETHRA, AND PENIS

**Barringer, B. S.: Surgery Versus Radium in the Treatment of Carcinoma of the Bladder.** *Internat. J. Surg.*, 1918, xxxi, 238.

Carcinoma of the bladder broadly speaking presents two types: the papillary type growing into the bladder, and the flat, indurative type extending through the bladder wall and thence outward. The flat indurative type is much more malignant. Combinations of the two types are often seen.

Radium has a distinct advantage over surgery in the treatment of bladder carcinoma. The physical peculiarities not only do not obstruct the treatment, but rather help it. Under radium treatment the bladder does not have to be opened, but the radium can be placed with more or less accuracy upon the tumor and left there. Moreover, the urine which fills up the bladder acts as a screen to normal parts of the organ.

The author has treated 43 cases of carcinoma of the bladder since October, 1915. The diagnosis in a majority of the cases has been confirmed by microscopical examinations. Five of the 43 cases, all of which were advanced, are well as proved by cystoscopic examination.

It is mainly on the record of 5 cases cured for varying lengths of time, so far as the bladder is concerned, and 3 other cases which will probably go into the cured column, that the author bases his claim for the efficiency of radium treatment in carcinoma of the bladder.

Pedersen, in discussing Barringer's paper on radium, quoted Kelly on fibroid of the uterus; 211 cases were treated with radium, and in 87 of these the tumors totally disappeared after one or two applications of radium in the cavity of the womb. The applications were made with practically a uterine sound bearing the radium which was introduced with no more distress or difficulty than is caused by an ordinary uterine sound. In addition to the 87, 60 other women received great benefit, solely from the radium.

In concluding, the author is of the opinion that

radium will do as much as surgery, perhaps a little more, and one can accomplish with one application of radium what requires fifty applications of fulguration.

THEO. DROZDOWITZ.

**LeFur, R.: Perforating Wound of the Bladder with Destruction of the Right Horizontal Branch of the Pubis; Primary Suture of the Bladder; Reconstitution of the Pubis** (Perforation de la vessie, fracas et destruction de la branche horizontale droite de pubis; suture de la vessie; reconstitution du pubis après résection sous-périostée de cet os). *Paris chirurg.*, 1917, ix, 702.

A soldier showed a deep contused wound of the suprapubic region, with section of the right cord necessitating castration, a large hæmatoma in the region of Scarpa's triangle, a large rupture of the bladder, and almost complete destruction of the right horizontal branch of the pubis. On the day following a preliminary laparotomy, a primary bladder suture was done. This not only failed but showed a slough at the site of suture.

A few days later osteomyelitis showed in the pelvis, necessitating a very complete opening up and surgical cleansing of the right pubis so that the right pubic branch disappeared completely. This resection however, was carefully done and Le Fur had the satisfaction of seeing that the right pubis became almost wholly reconstituted with very little functional interference with the patient's walking. A calculus formed about a small bone fragment in the bladder some months after the injury. It was removed by the lithotrite.

Le Fur says that it is better at the front formations not to suture the bladder primarily. None of the sutures thus made that he has observed have held. This is explained by the great degree of infection which is frequent in such patients, to the great difficulty of removing all the contused or infected tissues of the bladder without making unnecessary sacrifices of the bladder wall; also to the poor supervision of the retention sound, as competent assistants are not always found in the front ambulances. The only surgical conduct to follow is large drainage of the bladder by the hypogastric route. This does not delay recovery, but on the contrary advances it by preventing infection and necrosis of the bladder.

Le Fur also refers to the necessity of always making a resection of the pelvic bones subperiosteally, because reproduction of the bone tissue may then be expected even when the loss is very extensive. Besides, in such cases an almost complete restoration to normal of the osseous lesions may be observed. There need therefore be no despair in such cases of obtaining good functional results.

W. A. BRENNAN.

**Parmenter, F. J.: A New Operative Procedure in Impassable Stricture Without Perineal Section.** *Internat. J. Surg.*, 1918, xxxi, 137.

The author details a summary of the etiology, symptomatology, pathology and types, and gives



the common operations with their indications. He does not believe the objections of hæmorrhage and sepsis with internal urethrotomy for a postbulbar stricture valid if the cutting is not over 20 to 22 F. and if an indwelling catheter is used for dilatation for several days.

To decide the impassability of a stricture through an endoscope to the site, adrenalin is instilled causing shrinkage, so that a catheter or filiform can be passed.

The author uses a McCarthy endoscope and a special three-bladed knife. One cut of half an inch from behind forward is made. If the stricture is longer, the endoscope is advanced through the cut portion. Cotton applications control the hæmorrhage. A No. 18 catheter is passed through; the endoscope is withdrawn.

Permanganate irrigations and a catheter retention for three to five days are used.

A summary of cases is given with a description of the complications.

H. W. PLAGGEMEYER.

**LeFur, R.: Urethral Autoplasty for Loss of Substance with Destruction of the Urethra; Construction of a New Canal Without Stricture** (Autoplastie urétrale pour perte de substance, avec destruction de l'urètre; réfection d'un nouveau canal sans rétrécissement ultérieur). *Paris chirurg.*, 1917, ix, 679.

The soldier in the case reported had been wounded in the gluteal and perineal region; there was a left ischiopubic pelvic fracture, lesions of the testicles requiring double castration, and rupture of the urethra with enormous loss of urethral substance; the urethra was destroyed for 7 to 8 cm., there being no trace of the inferior, lateral, or superior walls. In spite of this large defect Le Fur was able to completely cure the patient. He reconstructed the canal by a series of urethral and perineal autoplasties by the strip method. The new canal shows no tendency to stricture. The full clinical details of the case are given and illustrated.

Le Fur lays down the following essential principles as common to the treatment of all urethral fistulæ, as well as the repair of all losses of urethral substance, whatever may be the mode of treatment employed. These principles must be employed to obtain success:

1. Wide removal of all cicatricial tissue. Generally not enough is removed and this is frequently the chief point which is neglected and the cause of failure. The freshening of the edges and the cutting of the autoplasmic strips must be in absolutely healthy tissue. In the case reported it was necessary to remove an enormous mass of cicatricial indurated tissue so that after its removal the wound was of an extent approximating that originally caused. The sutures made in healthy tissue have held.

2. A wide freshening up of important surfaces. The sutures must be made on surfaces of 1 to 2 cm. Galli tubes give good service and should be more frequently used.

3. The necessity of drawing off the urine (perineal or hypogastric) and of avoiding the retention sound. This latter is unquestionably the cause of a large number of failures and ought to be abandoned. Since replacing the retention sound by urine deviation, LeFur has only rarely had a failure, and recovery generally follows the first operation.

W. A. BRENNAN.

**Benedict, S. R.: Scrotal Skin Grafts in Severe Injuries of the Penis.** *South. M. J.*, 1918, xi, 438.

The author states that in repairing large cutaneous defects on the penis one should have, first, the granulating surface on the penis free from infection and necrotic tissue; and second, the flap should be the full thickness of the skin of the scrotum down to the knot including the dartos. It should have a very large base and this base should not be severed at one time, but preferably in two operations about a week apart. The flap should be cut at least half again as large as the area desired to cover, so as to allow for subsequent erection of the penis.

The author reports an interesting case where a man suffered an electric burn which removed the entire skin of the penis except for a little strip about the width of a lead pencil on the under surface. This large wound was repaired by the technique described above with an excellent result, both cosmetic and functional.

V. D. LESPINASSE.

## GENITAL ORGANS

**Ivanissevich, O., and Gregorini, H.: A New Operation to Cure Varicocele** (Una nueva operación para curar el varicocele). *Semana méd.*, Buenos Aires, 1918, xxv, 575.

The authors think that the present methods of treating varicocele are unsurgical and unsatisfactory because they are not physiological. Since varicocele is more frequently left-sided and the anterior venous packet is more usually attacked, it is logical to direct intervention to that packet alone. The authors note that the funicular and deferential arteries become incorporated in the vicinity of the internal orifice of the inguinal canal. This fact enables them to operate directly on the spermatic arteriovenous packet which consists of two, three or four spermatic veins and arteries only and which are easily recognized in the region of the internal orifice of the inguinal canal.

The skin is incised following the direction of the inguinal orifice; section of the skin, fascia and obliquus major exposes the cord and its elements. The cord is followed as far as the separations of the vessels referred to, and these after isolation from the spermatic veins are sectioned after double ligature. The spermatic packet is thus reduced to the artery and two venous stumps.

The author says that the method removes the essential cause of varicocele, that it preserves the spermatic artery, and that the funicular and de-



ferential arteries are preserved intact, a result which is not obtained by the other methods.

The authors have verified their method experimentally, but up to the present have had little opportunity to apply it in clinical cases.

W. A. BRENNAN.

**Castano, E.: Prostatic Cyst** (Quiste de la prostata).

*Rev. Asoc. méd. argent.*, Buenos Aires, 1918, xxviii, 317.

Castano reports a case of prostatic cyst in a man aged fifty-six years. The case was diagnosed as such, the author having been guided by the symptoms noted in a similar case reported by Albert Castano a short time before. The method employed for approaching the tumor was a transvesical prostatectomy approaching the tumor through the anterior face of the neck of the bladder. The author states that this method was practised six years ago by Castano and Elizado, although it was not published at the time.

Literature shows that prostatic cysts are of 3 varieties: (1) cysts produced by obstruction of the prostatic ducts with retention of secretion; (2) cysts formed in the prostatic vesicle or sinus; (3) hydatid cysts. Both in the case now reported and that to which the author refers, the cysts had deteriorated into carcinomatous prostates and the patients in each case died soon after operation.

In Castano's personal case the circumstances were such that complete enucleation was found impracticable and it was therefore attempted to treat the carcinomatous prostate by radium. The man died some months later apparently from some metastatic development.

The symptoms of cyst are similar to those of prostatic hypertrophy. In both the cases referred to there was retention of urine, and toward the end dysuria and hæmaturia as symptoms presumptive of malignant tumors; cystoscopy showed development of the prostatic tubes and Marion's sign, and the irregularities in the hypertrophied lobes confirmed the diagnosis of carcinomatous prostate and cyst.

W. A. BRENNAN.

**Simons, I.: Factors Determining Mortality in Prostatectomy.** *Interst. M. J.*, 1918, xxv, 469.

The primary mortality of prostatectomy in the hands of the general surgeon, according to Thomas, based on the report of twenty-six representative general hospitals in Pennsylvania and neighboring states, was 22.5 per cent.

The primary mortality of prostatectomy, as obtained by some of the representative urologists here and abroad, as is follows: (1) by the suprapubic method, Walker, in 112 cases, 5 per cent; Freyer, in 1,000 cases (first 100 cases, 10 per cent, last 100 cases, 3 per cent); (2) by the perineal method, Young, in 450 cases, 3.7 per cent; Watson, 6.2 per cent; Proust, 5.8 per cent; Leguen, in 1,026 collected cases, 8 per cent; (3) by both methods, Judd, 5.3 per cent.

In attempting to find the cause of such marked differences, it is necessary to inspect the problem with which they are dealing, and the answer may be forthcoming. The causes of death after prostatectomy may be grouped thus: (1) causes apparently unavoidable: pulmonary embolism; cerebral thrombosis or embolism; (2) causes partly avoidable by pre-operative study and pre-operative preparation of the patient: renal insufficiency; urosepsis; (3) causes partly avoidable by operative skill and methods: shock; hæmorrhage; pneumonia.

It must be admitted that the causes of death enumerated in (1) are unavoidable, and their incidence, based on statistical experience, is by no means high. Being unavoidable, their occurrence cannot account for the marked differences of mortality percentages between the two groups of operators mentioned at the beginning of this article.

Passing on to (2), the problem is faced of renal insufficiency and sepsis as causes of postoperative death, and the reasons for classifying them as partly avoidable by pre-operative study and preparation of the patient. The clinical picture of the prostatic is, as a rule, a man of advanced age, with more or less arteriosclerosis, consequent hypertension, and a small blood volume; he is suffering from a group of symptoms partly due to the absorption of noxious products formed by the putrefaction of residual urine in the bladder, and partly to the back pressure up the ureters on the kidneys, with a lack of elimination of normal urinary products, and a resultant retention of nitrogenous bodies in the blood.

How are such elements of risk to be even partly avoided by pre-operative study and preparation? After a preliminary physical examination there are several important points in urinalysis. A phenol-sulphonephthalein test should be made by giving 0.006 gr. of the dye intravenously, and a note being made of the time of its first appearance. A delay in the appearance of the dye beyond ten to fifteen minutes is not a favorable feature. Also, patients who eliminate less than 30 per cent of the dye in two hours had better be observed until a higher figure (40 to 50 per cent) is reached. Blood chemistry is of great service.

The value of cystoscopy cannot be under-estimated, through it is possible to obtain the function of each kidney separately and at times to observe a flow of pus from one or both kidneys, which makes the prognosis more grave; and through the cystoscope it is possible to ascertain whether there is merely a median lobe or a general hypertrophy.

Having arrived at a conception of the case from a thorough study of it, the question arises, about which there is still considerable discussion, namely, the question of one-stage and two-stage prostatectomy, or what is to be done with the cases that are bad risks? It has always seemed to the author that this class of cases can be done in one stage with preparation, provided that the preparation is thorough, and that this method is as safe as the

two-stage method and has advantages over it. In these cases the preparation is somewhat as follows: The patient is allowed to be ambulant, but in the hospital. He is kept on a regular diet. He is put on forced fluids and urotropin, with the addition of sodium benzoate and boric acid if there is alkaline cystitis. He is now put on catheterization and bladder lavage for a few days or a week, the phenolsulphonaphthalein output being estimated every few days. A permanent catheter is now inserted and plugged with a cork. During this period of permanent catheterization the bladder should be washed and the patient watched for clinical signs of renal insufficiency and, if these should ensue, the catheter should be removed and the preparation resumed later.

In certain cases where there is complete retention and catheterization is impossible even with a stiletted rubber catheter, it may be advisable to confine the patient to bed, to make a tiny suprapubic incision, and inserting a large trocar (26 to 30 French) into the bladder, put a catheter through this, and, removing the trocar, continue the above technique by means of the suprapubic catheter.

The chief things that should delay operation are a poor general condition of the patient, a falling blood-pressure, urea and phenolsulphonaphthalein excretion, and an acute epididymo-orchitis on the institution of the measures of preparation.

The measures directed toward the avoidance of renal insufficiency and sepsis are summarized as follows:

1. Few, if any, and perhaps no prostatectomies are urgent.

2. The secondary symptoms of prostatic obstruction should be relieved, if possible, before the patient reaches the operating table. This is really a preparation of the kidney for the sudden (operative) relief of back-pressure to which it has become more or less accustomed.

3. The infected bladder should be cleansed as far as possible.

4. Delay in operation is always advisable in the presence of complications or of fever that cannot be explained, as this may be due to pyogenic infection of the kidney.

5. The one-stage operation with preparation is preferred in most cases where the two-stage operation is usually said to be indicated.

The second problem is that of the diminution of operative and postoperative shock, hæmorrhage, and pneumonia. These are to be considered as partly avoidable by operative skill and operative methods.

The measures directed toward the avoidance of shock, hæmorrhage and pneumonia are as follows:

1. The cystotomy should be done under local anæsthesia, preferably with a rather high incision.

2. Speed during the cystotomy operation is not only unnecessary but undesirable.

3. The enucleation of the gland should be done under gas and oxygen: narcosis with ether should be avoided; spinal anæsthesia is less dangerous than that with ether.

4. In enucleation of the gland, speed and skill are very desirable and materially diminish mortality.

In no other operation is the after-treatment so important and so laborious. Neglect of this means material increase in mortality statistics, and is no doubt responsible for the mortality in the hands of some surgeons. The after-treatment should include:

1. Avoidance of supine position as soon as possible on account of the danger of hypostatic congestion of the lungs and pneumonia in the aged.

2. Rapid resumption of full diet.

3. Rapid removal of drainage in order to prevent an indurated suprapubic sinus.

4. Assumption of drainage through the urethra by the early insertion of a retention urethral catheter.

THEO. DROZDOWITZ.



# SURGERY OF THE EYE AND EAR

## EYE

**Basterra, S.: Detailed Technique of Extirpation of the Lachrymal Sac** (Técnica detallada de la extirpación del saco lagrimal). *Prog. de la Clin.*, Madrid, 1917, v, 277.

The author states that extirpation of the lachrymal sac is the most frequently used method of combatting dacryocystitis in modern ophthalmology. But in spite of being standardized, it is unquestionably in most cases one of the most difficult operations in ocular surgery to execute well. The author thinks the reason for this is that even in the best textbooks details of the operation are omitted. It is in understanding and attending to all the details that the success of the operation depends.

The author therefore in this article gives a very elaborate description of every phase of the technique as followed in the Vienna school. The article is accompanied by a series of colored plates illustrating each stage in the operation: the anæsthesia injections; incision of the skin; exposure of the sac after the sectioning of the overlying muscles, isolation and removal of the sac.

The complications which may arise during and after the operation are also described.

W. A. BRENNAN.

**Brav, A.: The Clinical Value of Pupillary Changes.** *N. Y. M. J.*, 1918, cviii, 143.

In a study of the pupillary changes that may be observed, the author makes note of the following conditions: (1) form and color of the pupil; (2) size of the pupil; (3) contents of the pupil; (4) asymmetry of the pupils; (5) reaction of the pupil; (6) associated ocular conditions. Much may be gained by such a systematic observation as thus outlined, both as to the local condition of the eye and also general constitutional disease.

The above conditions are discussed at some length to show the value of making observation of the pupil of the eye and what may be thereby gained in diagnosis of disease of the eyes and general systemic disease. The author makes the point that it is only the combined observation giving a symptom complex that is to be of aid in diagnosis.

A dilated pupil alone cannot point to a definite pathological condition. However, a dilated pupil associated with inflammatory symptoms of the eyeball, a steamy cornea, reduced vision and high tension at once points to a definite clinical condition, i. e., acute glaucoma.

On the other hand, a dilated pupil that does not react to light, not accompanied by inflammatory symptoms and associated with paralysis of the internal rectus, and accommodative disturbances points

at once to paralysis of the oculomotor nerve. A partially dilated pupil with lateral nystagmus and temporal atrophy of the optic nerve is pathognomonic of multiple sclerosis.

A contracted pupil that does not react, associated with inflammatory symptoms of the eye, is diagnostic of acute iritis, while a contracted pupil that does not react to light, which is slightly irregular and shows signs of adhesions accompanied by a diminution of vision, is indicative of chronic iritis. A contracted pupil that does not react to light, but is round, whether associated with a reduction of vision or not, is practically always diagnostic of cerebrospinal syphilis. J. S. CLARK.

**Doyle, P. G.: Myopia and Myopic Astigmatism in Relation to the Glare of Mesopotamia.** *Brit. M. J.*, 1918, i, 563.

During at least nine months of the year the glare in Mesopotamia is such that glare-protectors fitted with a green tinted glass must be worn by the troops, and these have been stated to be as important in preventing heat stroke as the sun helmet. This is too positive a statement, as victims of heat stroke are suffering from a toxæmia, usually the early stages of sand-fly fever or malaria, but persons with myopia and especially myopic astigmatism are often affected by the glare to such an extent as to render them useless for any outdoor employment. An explanation is not offered.

A case is cited of a myope of 6.0 w 2.0 cyl. who became blind on coming out of a church; he recovered in darkened surroundings, and again lost vision when sent to the parade ground later. His amblyopia disappeared after a week's treatment with strychnia and he was assigned to other service.

S. S. HOWE.

**Loeb, C.: A Report of Some Interesting Ophthalmologic Cases.** *Illinois M. J.*, 1918, xxxiii, 257.

In the first case reported, at birth and after normal delivery, it was noted that the eyelids of the child were greatly swollen and that there was a slight discharge. Ten hours later the author saw the case. The lids were swollen and retractors were required to separate them. An ulcer was found on the lower left lid 4 mm. by 1.5 mm. From a smear and culture a diagnosis of pseudodiphtheria was made. The fellow eye showed only slight discharge. Loeb concludes that the infection was intra-uterine and bases his conclusions on these points: (1) normal labor; (2) the appearance of the eyes at birth; (3) impossibility of the development of an ulcer between birth and the time he saw the case, viz., ten hours.

The second case was that of a baby whose eyelids

at birth were swollen and bulging. Maternal complications prevented attention being paid to the eyes of the child for an hour, when 2 per cent silver nitrate was instilled. Four hours later retractors separated the greatly swollen lids and revealed much discharge. The cornea was intact. A smear showed staphylococci and streptococci, but no gonococci, while a culture was negative. Under cold compresses, 5 per cent silvol and later 2 per cent zinc sulphate was administered. The case recovered in ten days.

The third case was an adult with typical acute iritis of the right eye, who gave a history of rheumatism, but no syphilis. The usual treatment was instituted and his condition improved. Ten days later an acute exacerbation occurred. The tonsils were removed because of a suspicion of focal infection. The eye became worse for a few days, then improved. Thirteen days later there was another relapse. Four days later injections of autogenous vaccines prepared from the tonsils were begun and the eye made a rapid improvement. In ten days the inflammation had disappeared. Two weeks later the patient returned stating that his left eye had become flushed and that he had used atropine. With a history of an attack of gonorrhoea seven years before, and in view of a complement fixation test being 35 per cent positive, injections of gonorrhoeal vaccine were instituted. These were given three times a week for four weeks with a resultant improvement in general health and no return of the eye condition. Loeb deems this a case having two foci of infection; he thinks that the gonococcal infection was primary and that the tonsillar condition was due to metastasis.

The fourth case gave a history of recurrent attacks of iritis extending over a period of eight years, with some rhinitis and pharyngitis. The only foci treated seemed to be tonsillar and nasal. The teeth had been neglected, and were literally bathed in pus. For a long time the patient refused to have the teeth extracted. A year later another attack of iridocyclitis occurred in the left eye. Between January and July there were four attacks. On July 1 the teeth were extracted. Since that time there has been no further trouble. The author calls attention to the fact that all possible foci must be eradicated to effect a permanent cure.

The fifth case was a double cataract in a man sixty-two years of age. There was persistent dilatation of the pupil for a period of six months after a combined extraction in one eye, then it subsided with resultant good vision.

The fellow eye was operated upon six months later with good results. The author cannot explain the high degree of pupillary dilatation, its continued dilatation after withdrawal of the atropine, nor why it spontaneously disappeared six months later. The interesting point is that a previous astigmatic condition changed from a myopic oblique form to a spherical refraction in one eye and a hyperopic astigmatism, axis 180, in the other.

Loeb concludes that the healing of the corneal incision altered the curvature of the cornea to such an extent as to compensate for one eye and to over-correct it in the other, changing it to an hyperopic astigmatism. He deems it therefore justifiable in high astigmatism to make a simple corneal incision in the hope that subsequent healing will produce a lessened amount or at least a small amount of astigmatism.

The sixth case was a patient aged fifty-five years, with a cataract of the left eye. It was apparently a normal case. The tension was slightly lowered, with perception and projection good. At the conclusion of the corneal incision there was a collapse of the eyeball. The sclera seemed to fall in through lack of support. The operation was completed and the lens extracted by the use of the loop; there was no loss of vitreous. An air bubble appeared in the anterior chamber and this was partially expressed. The patient was kept quiet for an hour upon the operating table following the operation. Loeb expected an intra-ocular hæmorrhage, and was agreeably surprised to find the eye all right at a subsequent dressing. The air bubble was gone, and there was a slight iritis. The author does not fear the presence of an air bubble following extraction. He attempts to express it, but is not concerned at his failure to do so.

In the seventh case, a marked œdema of both eyelids followed a Smith double operation for cataract. An interval of two weeks intervened between the two operations. At first there was fear of infection, but this did not occur, and healing was normal. A conjunctival redness continued for several days, as did the swelling of the lids. Loeb has never experienced this condition following other cases of the Smith operation and he is led to believe this probably an angioneurotic œdema, but as to its cause he confesses no knowledge.

In the eighth case a report is made of a bilateral dislocation of the lenses of both eyes into the vitreous. While floating freely therein, they would fall in their normal position with the head lowered. With but slight hope of a successful outcome an extraction was done with the usual steps of the von Graefe method, except for the fact that the lens was delivered with the wire loop. Thirty-six hours later the dressings were found bloody and the patient in severe pain. Upon examination it was found that the corneal incision was separated and between the lips of the wound a clot presented which extended back into the eyeball. Vision was gone. Tension was greatly increased, and the patient in great pain. Enucleation followed.

J. S. CLARK.

**Slocum, G.: Report of a Case of Cicatricial Ectropion Corrected by a Plastic Operation. *J. Mich. St. M. Soc.*, 1918, xvii, 189.**

The patient was a man of thirty-five who had suffered such a burn of the right lower lid and cheek at ten years of age that a cicatricial ectropion resulted of such an extent that the lashes rested on



the cheek. A Blasius flap from the temple was carried below the lid lifting it to its normal position; but owing to too great laxity of the lid border and hypertrophic conjunctivitis the deformity was changed from a cicatricial ectropion with stretching and displacement of the lid to a flaccid ectropion.

The conjunctiva was reduced by the alum pencil and the Ziegler cautery operation, following which the Kuhnt-Szymanowski procedure for shortening the lower lid was done with a perfect result, bringing the lid close against the eyeball.

Photographs of the case and seven textbook illustrations of the operations accompany the article.

S. S. HOWE.

**Srinivasachary, E. V.:** *Cataract. Madras M. J.*, 1918, i, 81.

Observations made at Smith's Clinic at Jullandhar are recited in order.

Vitreous escape in the intracapsular operation is certainly not a part of the Daviel procedure. The drop mentioned is practically not much more than the pharmaceutical drop, owing to the method of holding the lids. Since in the Daviel operation with the appearance of vitreous there is nothing to do but to close the eye at once, a poor result could be expected, for if all lens material were forced out with the vitreous, good vision would have resulted, it being retained lens material with vitreous loss that is to be feared.

The fact that no instructions as to how he shall act or hold his eye are given the patient either before or during operation is considered important, as Daviel's operation and successful extraction in a nervous patient are often incompatible.

In spite of the preparation, consisting of douching with 1:2,000 perchloride, or 12 per cent silver nitrate in bad trachoma cases a few days before, the patients get on wonderfully well. Ambidexterity is not cultivated in Madras or Punjab, as the right hand acquires a much higher degree of efficiency when always used than if both are trained.

In permitting removal when the cataract unfits its possessor for the performance of his ordinary duties, the Smith has its greatest advantage over the usual operation.

Postoperative iritis is never seen, as atropine is not used and there is no capsule or cortex left behind to irritate the iris, and as only one instrument is introduced within the eye, sepsis is exceptional.

The absence of after-cataract is of great importance, as the average Indian peasant is as exacting as regards vision as any individual, and if left with a secondary cataract would go back to his village with the report that he fared no better at the hands of the city doctor than he would have if treated by an itinerant lens coucher. S. S. Howe.

**Zarzycki:** *Ocular Osteoplasty* (De l'ostéoplastie oculaire). *Paris chirurg.*, 1917, ix, 690.

Zarzycki, in order to attain the ideal artificial eye having synergic movements with the other eye,

after enucleation fills the cavity with an osteoperiosteal living graft. The operation is done in three stages. The first stage consists of enucleation, lavage and temporary tamponing of the cavity with sterile gauze until ready to receive the graft. The second stage is the preparation of the osteoperiosteal graft which is taken from the upper third of the internal face of the tibia. The graft is trimmed to the proper size and is about 1 to 2 mm. thick. The third stage consists in the transplantation of the graft. It is sutured with fine catgut to the conjunctiva, not involving the periosteal surface however. No drainage is made.

Zarzycki states that the graft lives and that new bone tissue is produced by the osteogenetic power of the graft. The evolution of this new bone formation may be followed under the screen. The results as regards mobility are much better if musculoconjunctival suture of the rectus muscles is done in the first stage.

The artificial eye may be fixed after the fifteenth day. Details of the technique are given.

W. A. BRENNAN.

**Levin, I., and Cohen, M.:** *The Action of Radium on Cataract. N. Y. M. J.*, 1918, cviii, 4.

The authors make a preliminary report upon their experience with the use of radium in the treatment of cataract. Three cases were reported in which radium is used with what seemed to them very beneficial results; there was increased fundus reflex, larger areas free from lenticular striæ, and an increase in visual capacity. The authors have undertaken a broader study of the subject upon animals, upon which they expect to make a more extensive report at a later date.

As to the technique of application of the radium therapy, they make no detailed report at this time but promise this feature in their next paper.

J. S. CLARK.

#### EAR

**Dench, E. D.:** *Otitic Meningitis. Laryngoscope*, 1918, xxviii, 501.

While including under the term otitic meningitis in its broadest sense such conditions as extradural abscess and serous meningitis, the chief purpose of the author in the present communication is to give his views on the treatment of otitic leptomeningitis. These cases he divides into (a) fulminating, (b) frank, and (c) latent types.

The fulminating present the well-recognized symptoms of meningitis, are easily diagnosed, and terminate fatally in from twelve to forty-eight hours. While this type may be due to an otitic infection, the author believes that many of these cases can be better called coincident meningitis, as autopsy has frequently failed to reveal the connection with the otitic infection. The frank cases likewise present the well recognized symptoms of meningitis and offer no difficulties in diagnosis. But the latent

cases are the ones offering the greatest difficulty in diagnosis and the ones which can be given most help by surgical intervention.

In these cases the first symptoms which present themselves are those of general malaise, moderate temperature ranging from  $99^{\circ}$  to  $101^{\circ}$ , some headache and vomiting, particularly when these occur after an operation on the middle ear and mastoid.

As regards treatment, the author advises:

1. Removal of the primary focus of infection.
2. Exposure of a large area of dura, with subdural drainage in cases of the fulminating type.
3. Repeated lumbar punctures in all cases.

In conclusion the author holds out a hope for every case when surgical intervention is permitted, unless they are actually *in extremis* when seen by the surgeon.

OTTO M. ROTT.

**Kerrison, P. D.: Report of a Case of Chronic Middle Ear Suppuration Treated by the Carrel-Dakin Method, Following a Radical Operation.** *Laryngoscope*, 1918, xxviii, 537.

After the radical operation, the wound cavity was flushed with Dakin's solution. A short gauze wick, saturated with the same fluid, was placed loosely in the cavity and a gauze dressing applied. On the following morning this dressing was removed and the following routine instituted:

The nurse was instructed to fill the wound cavity every hour during the day with Dakin's solution, the patient lying for twenty minutes thereafter with the sound ear buried in the pillow, after which the fluid was allowed to run out and the ear protected with sterile absorbent cotton. At night, i. e., at the time of the last Dakin bath, the wound cavity was dried, then filled with chlorazine paste and a protective gauze dressing applied.

The treatment was carried out for three successive days. Then once daily the wound cavity was thoroughly irrigated with Dakin's solution. The cavity, having been dried, was then filled with chlorazine paste and further protected by a pad of sterile cotton placed in the concha and held in position by collodion. This was done daily during the first three weeks and thereafter on alternate days.

Epitomizing the effect, the author states that in actual duration of the postoperative treatment, this method did not in this case result in curtailment, as he was discharged as cured exactly two months after his operation. Chlorazine paste seems greatly

to promote epidermization in certain parts and in others to retard it. The following advantages may be directly attributable to this method:

1. The bone cavity from start to finish seemed surgically clean.
2. There were no masses of granulations to contend with.
3. Epidermization over essential points, e. g., the posterior recess and the eustachian orifice, was particularly rapid.
4. Treatment is practically without discomfort to the patient.

OTTO M. ROTT.

**Jones, J. A.: Mastoid Disease in the Balkans; Some Notes on Diagnosis.** *Lancet*, Lond., 1918, cxciv, 704.

In the Balkans there are two diseases met with which may present symptoms simulating mastoid disease, namely, trench fever and malaria. Through error of diagnosis two cases of the former and one of the latter were operated upon for mastoid disease. In the two cases of trench fever it would seem that the condition of the mastoid process must have been analogous to that of the tibia which is so commonly met with in this disease. There was very marked tenderness on slight and deep pressure over the mastoid process, with an evening temperature of  $101^{\circ}$  F.

The case of malaria had had a mastoid operation five years previously. The symptoms were those of a recurring condition and a second operation was performed with absolutely negative findings. A course of quinine cleared up the case subsequently.

P. W. SWEET.

**McBride, P., and Turner, A. L.: War Deafness, with Special Reference to the Value of Vestibular Tests.** *Lancet*, Lond., 1918, cxcv, 73.

The authors have reached the following conclusions:

1. Concussion deafness is generally due to some organic change.
2. The prognosis is usually bad.
3. The results of the vestibular tests can only be utilized in conjunction with information derived from other sources. If the patient shows other hysterical symptoms, vestibular tests may perhaps under certain circumstances help diagnosis; but to state that they do more than this is misleading and dangerous.

OTTO M. ROTT.



# SURGERY OF THE NOSE, THROAT, AND MOUTH

## NOSE

**Babcock, J. W.:** Bacteriological and Clinical Aspects of Infection of the Accessory Sinuses of the Nose. *Laryngoscope*, 1918, xxviii, 527.

This investigation was undertaken in an attempt to correlate the bacteriological findings with the clinical types of sinusitis, and if possible to give aid in making an early prognosis and in selecting an appropriate form of treatment. This study revealed the fact that the pneumococcus is pre-eminently associated with acute attacks and the streptococcus with chronic sinusitis, staphylococci being well represented in both groups. It was also noted that acute cases are more often associated with a single organism.

Very little difference in the length and kind of treatment and results to be expected in the different groups of acute cases has been found. But in the chronic cases it was found that the staphylococcus group had the longest average duration of treatment and a low percentage (62) of cures, with a high percentage (40) of operations required.

OTTO M. ROTT.

**Citelli, S., and Caliceti, P.:** Hypophyseal Feminism in Adenoid Subjects (Su tre soggetti adenoidi con femminismo ipofisario). *Policlin.*, Roma, 1918, xxv, sez. prat., 245.

In a previous report Citelli has shown that in certain adenoid subjects a psychic syndrome may be observed, especially in adolescence. This syndrome consists in a marked deficiency in memory, in somnolence or insomnia, in lack of power to fix the attention, and in intellectual weakness. This syndrome may even be observed in various diseased conditions of the nasopharynx and sphenoid regions, especially tumors. It is probably of hypophyseal origin.

The authors report the details of three cases observed in soldiers. In these cases there was a history of adenoids which had not been treated, remnants of which still persisted. The syndrome was marked in the three cases, and in addition there was very manifest feminism. In all three cases there was a marked local and general reaction to subcutaneous injections of hypophyseal extract, a reaction which was not observed in controls.

The authors think that the occurrence of such a psychic syndrome in adenoid subjects is not very unusual. Citelli connected this syndrome with the hypophysis, and its occurrence in the cases noted by the authors, together with the marked feminism and reaction to pituitary extract, appears to them to be a confirmation of its hypophyseal origin. This feminism has not previously been noticed in adenoid subjects. The authors are satisfied that it was of

hypophyseal rather than of sexual origin since in all cases the genitalia were fully and normally developed.

They think the change in the hypophyseal secretion is a qualitative one rather than quantitative. There was no hypophyseal tumor, as their investigations showed; but they think that any functional and minute alterations in the gland occur through indirect routes (such as the basisphenoidal), and that adenoid growths are the essential cause of these changes in individuals predisposed to hypophyseal disturbance. The possibility of mental disturbance is a further reason why adenoid growths should be removed early, because if such changes in the hypophysis become manifest, it will be too late for any effective treatment.

W. A. BRENNAN.

## MOUTH

**Allen, H. R.:** Restoration of Part or All of the Lower Jaw. *J. Indiana St. M. Ass.*, 1918, xi, 230.

Allen makes a preliminary report on restoring part or all of the lower jaw. He recommends an incision two or more inches below and parallel with the clavicle on one or both sides, depending upon the case. The incision must be sufficiently long so as to obtain the proper amount of skin and soft tissues plus the superior and anterior section of the upper half of the clavicle. The lower skin incisions may be carried directly across or pointed upward toward the median line. At the end of the horizontal incision, vertical incisions free the flaps accompanying the proper lengths of the superior portions of the clavicle on both sides, providing both sides require restoration.

The bone and soft tissues, with its circulation impaired though not cut off, is drawn upward and sutured to the denuded face and raw tissues above. The lower flap of skin and fascia may be used to cover raw surfaces to extend across and form a floor for the mouth.

M. N. FEDERSPIEL.

**Bubb, C. H.:** Some Principles Involved in the Treatment of Mandibular Fractures. *Proc. Roy. Soc. Med.*, 1918, xi, Sect. Odontol., 27.

The author calls attention to the difficulty of interpreting roentgenograms of mandibular fractures. Though the X-ray is a great help in the diagnosis of this type of fracture, to show the condition of the bony ends, the presence of comminution, a root, tooth, or foreign body, it is not without fallacies as a guide to the actual bony loss, especially in later cases of non-union. He quotes one case which from the X-ray was considered suitable for bone-grafting, but in which operation revealed such an extensive bone loss that grafting was impossible.

He says the intrabuccal film method where applicable yields better and more accurate information both as to the extent of the gap and the depth of the fragments.

He divides his treatment into: (1) the initial treatment of frequent irrigation, using various types of antiseptics; (2) the cleaning-up operation, which he discusses under two headings: (a) extraction of teeth; (b) procedure at the site of fracture.

His method in the cleaning-up operation is one of ultra-conservatism. Teeth or roots actually in the line of fracture are removed, but no unnecessary removal of teeth is done. He claims that the early removal of such roots or teeth, especially when situated adjacent to a fracture, is, owing to rapid absorption of the alveolus, a frequent cause of the neighboring and lacerated soft tissues becoming adherent to a more extensive area of bone, thus rendering it more difficult for the subsequent adaptation of a denture. Owing to the fact that such patients have their mouths frequently irrigated, it has not been found that the deferring of any necessary extractions at this stage has rendered them more liable to pneumonia, gastritis, or enteritis.

He never removes any splinters or comminuted fragments of bone unless entirely detached from surrounding tissues. In the early stages this physical condition must be regarded as the only reliable guide, as no X-ray evidence is of the slightest value in demonstrating viability. He interferes with the site of fracture as little as possible. Early reduction in correct alignment and early splinting to keep the fragments and comminuted pieces of bone at rest has proved to be the soundest and most certain method of controlling and combating sepsis.

As regards alignment in treating fractions of the mandible, it has been his invariable rule to reduce and splint in correct dental occlusion, irrespective of the interval that may be thereby produced between the ends of the fragments. In order to follow this procedure, early splinting is necessary. In favorable cases the gap can be completely bridged by bone thrown out by such comminuted fragments, in conjunction with similar outgrowth from the ends of the mother bone.

In two of his cases gaps up to  $2\frac{1}{2}$  cm. were bridged over with new bone, although no comminuted fragments appeared to be present. Both fractures were situated in the region of the symphysis. The fragments had been allowed to fall together, producing the characteristic V-shaped deformity, and in this malposition union had occurred. Surgical intervention was resorted to and a bony union resulted in both cases within three months. In 17 cases with malocclusion this procedure was adopted with uniformly satisfactory results. For the reduction of this type of deformity he has never resorted to the use of an orthodontic appliance. Out of 270 cases that have come under his observation soon after the infliction of their injury, non-union occurred in 30 cases.

He discusses two types of splint. The first is by means of circumferential wires, as suggested by Cole. This method has proved satisfactory, especially in edentulous cases in which the anterior ends of the fragments are so prone to become tilted downward when other types of splints are used. The second type is a modified Gunning, with a flange extending backward to control the posterior fragment. This flange is lined with soft rubber or gutta-percha. This splint is always fixed in the open-bite position, the advantages of which are:

1. All parts of the mouth are rendered accessible for purposes of cleansing and irrigation.
2. There is greater comfort of the patient, greater facilities for feeding, and a greater range of diet possible.
3. Trismus is prevented in patients liable to this complication.

4. The open-bite position is essential in intra-tracheal methods of anæsthesia.

5. The chances of obtaining bony union are greater in this position than in any other.

He lays great stress on the control of the posterior fragment. He says the difficulty urged by some of insuring a correct occlusion in the open-bite position is an imaginary one. It is merely a question of mounting models on an articular correctly in exactly the same way as should be done for setting up a full upper and lower denture. Instead of using Snow's face bow, he uses an outside spring caliper with spring nut. The only measurements required are the distance from condyle to median alveolar margin of the upper jaw, and the transverse condylar diameter less one-fourth of an inch allowance for soft tissue coverings. His formula has been normal occlusion plus mandibular rigidity, as opposed to normal occlusion versus mandibular rigidity.

G. W. HOCHREIN.

**Greenough, R. B.: Radium in the Treatment of Carcinoma of the Buccal Cavity.** *Boston M. & S. J.*, 1918, clxxviii, 598.

Greenough calls attention to the advantage of radium in the treatment of carcinoma of the buccal cavity.

In the 28 months from April, 1912, to January, 1916, 139 cases of mouth cancer presented themselves at the Huntington Hospital. They were divided as follows: lip, 39 (radium used in 19 cases; improvement in 8); palate, 8; lower jaw, 36; upper jaw, 11; tongue and floor of the mouth, 33 (radium used in 26 cases; improvement in 9); tonsil, 7; cheek, 5.

He attributes the causes to pyorrhœa and ill-fitting tooth plates or jagged teeth which wound and keep the surface of the cheek or tongue irritated. Tobacco is also a common source of irritation to the buccal mucosa.

The best opinion of the present day is opposed to the exploratory excision of fragments of tissue for early cancer diagnosis, on the ground that cutting into cancer tissue tends to spread the



disease. The diagnosis can be made by other methods, and the incision can be avoided.

M. N. FEDERSPIEL.

**Wade, R.: Methods of General Anæsthesia in Facial Surgery.** *Lancet*, Lond., 1918, cxciv, 794.

In operations on the face and lower jaw the maintenance of good airway and avoidance of interference with the aseptic technique and the field of view of the surgeon are the two main difficulties encountered. From the anæsthetist's point of view such plastic operations may be divided into two groups: those in which blood finds its way into the air passages; and those in which it does not.

The author describes five different methods of anæsthesia in the lying-down position and two in the sitting-up position, and discusses the merits of each and the class of cases best adapted for each method. In the summary an extensive table is given

of the types of operation and methods of administration of the anæsthetic most suitable for each case.

P. W. SWEET.

**Aguirre, R. T.: Congenital Ranula of the Tongue Developed in the Left Blandin-Nuhn Gland.** *Surg., Gynec. & Obst.*, 1918, xxvii, 45.

Aguirre reports a case of congenital ranula in a girl thirteen years old. The operator proved that the mass developed from the left Blandin-Nuhn gland.

After sectioning the anterior wall of the cyst and evacuating its contents, the interior was cauterized with silver nitrate, tamponed with iodoform gauze, and covered with a moist dressing. On the second day the cyst wall, modified by the cauterization, was detached by hydrotomy and by the twelfth day the cavity closed, giving the tongue normal function.

M. N. FEDERSPIEL.

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# INTERNATIONAL ABSTRACT OF SURGERY

DECEMBER, 1918

## ABSTRACTS OF CURRENT LITERATURE GENERAL SURGERY—SURGICAL TECHNIQUE

### ASEPTIC AND ANTISEPTIC SURGERY

**Fraser, F., and Others: Primary and Delayed Suture of Gunshot Wounds; a Report of Research Work at a Casualty Clearing Station.**  
*Brit. J. Surg.*, 1918, vi, 92.

This paper is a report of the research work on primary and delayed primary suture of gunshot wounds done at a casualty clearing station from December 27, 1917, to March 1, 1918, under the direction of Fraser. Included in the paper is a report on the bacteriology of wounds by Stokes and Tytler.

For the purposes of this work during the period mentioned only men suffering from wounds of the upper and lower limbs were admitted to the casualty clearing station. Of these 60.8 per cent were entered on the research list as being cases suitable for immediate or early suture.

Patients suffering severely from shock and loss of blood, who are not in a condition to bear a thorough cleansing operation, and whose tissues have lost much of their normal power of resisting infection, are not as a rule good subjects for primary suture. Patients who show signs of already established infection of the tissues surrounding the wound must also be rejected. These form a large class and include the majority of men whose arrival at the casualty clearing station has been delayed beyond twelve hours.

Wounds have been sutured without the aid of antiseptics, and also with "bipp," flavine, and dichloramine-T dissolved in chlorinated soft paraffin. The number of cases treated with these solutions is too small to warrant any positive conclusions regarding their value.

Every case, excepting through-and-through wounds or contour wounds with no damage to bone, is examined by X-ray before operation.

A specimen is taken from each wound for culture immediately before operation. The method used at the casualty clearing station could well be employed in civil practice. For this purpose a swab is used,

contained in a glass tube in the upper end of which cotton-wool is packed. The whole is placed in a test-tube, the mouth of which is also plugged with wool. The apparatus is sterilized in the autoclave, and when the specimen is to be taken, the inner glass tube with the swab is withdrawn and placed in contact with the wound. The swab is then thrust down into the depths of the track and thoroughly smeared on all parts of the wound which can be reached. It is then withdrawn into the tube and both are replaced in the test-tube. This method was introduced by Stokes.

Previous to operation the patient's skin is shaved, washed with soap and water followed by spirit, then painted freely with a 5 per cent solution of picric acid in spirit.

The technique of operation is as follows: A very narrow margin of skin around the wound is excised in the form of an ellipse. Then the incisions are prolonged sufficiently to obtain a full exposure of the track. With the aid of good retractors, the walls are removed with scissors or knife. All soiled, dead, or severely bruised muscles are snipped away until healthy contracting and bleeding tissue is exposed. As little healthy tissue as possible is removed. The fingers are not permitted to touch the tracks. Instruments are changed frequently or rinsed in 1:20 carbolic acid from time to time.

The operation is not complete until every part of the wound has been dealt with, and every fragment of dead muscle removed. Important structures, such as main vessels and nerve-trunks, which cannot be excised, should be carefully cleaned with knife, scissors, and swabs. The use of dyes, such as 5 per cent solution of methylene blue or brilliant green in 20 per cent formalin, which has been recommended strongly by the French surgeons, is considered by the authors to be of some value in dealing with large wounds where small patches of dead tissue are apt to escape attention.

In the case of compound fractures, the wound in the soft tissues is dealt with as above described, and foreign bodies and loose fragments are lifted out and



sharp points cut off. Blood-clot is carefully wiped away from cracks in the neighborhood of the main fracture. As to the closure of cavities after removal of bone, the authors' experience has not been sufficient to express an opinion as to the best method to be adopted.

The operation is completed by careful hæmostasis. For smaller vessels this is best secured by leaving on pressure-forceps, such as Lane's, during the operation. Larger vessels are ligatured with catgut, care being taken that as little tissue as possible is included in the ligature.

The question is now to decide whether the wound should be sutured or left open. The size, gravity, and appearance of the wound, the time which has elapsed since its infliction, and the condition of the patient, must all be taken into account. Primary suture is justifiable, provided: (1) that the wound is not of more than fifteen hours' duration; (2) that the surgeon feels that he has been able to cleanse it satisfactorily, and has removed all foreign bodies; (3) that closure can be effected without undue tension; and (4) that the patient need not be moved for several days at least. Undermining of skin flaps and other plastic measures for closing wounds should not as a rule be undertaken at the primary operation unless a bacteriological examination has already been made and it is certain that virulent organisms are not present.

The method of suture consists in placing accurate coaptation sutures which draw together the muscles and emerge from the skin wide of the edges of the wound. If tension is present these are tied over rubber tubes or lead plates. The skin edges are then brought together by interrupted sutures, with an interval of one-half to three-fourths of an inch. No buried catgut sutures are employed.

It is well to dispense with drainage altogether. Rubber tubes should not be used. If interrupted sutures are used and not placed too close together, sufficient escape of blood and serum generally takes place between them and further drainage is unnecessary. In the presence of persistent oozing, it is better to pack the wound, leave it open, and suture it at the first dressing.

Many of these patients have little constitutional disturbance after operation, but a rise of temperature lasting for one, two or three days is common. The most virulent infection met with after operation is the hæmolytic streptococcus. A sutured wound infected by these organisms will almost certainly go wrong.

The patient infected with hæmolytic streptococci has an anxious look, complains of pain in his wound, sometimes has nausea and vomiting. Temperature and pulse are on the up-grade and the skin around the wound is oedematous for some distance. No time should be lost in opening such a wound widely and beginning treatment with some antiseptic, such as the Carrel-Dakin, flavine, or "bipp."

Cases that are doing well are usually dressed at the end of forty-eight hours, after which it is unnecessary to change the dressing for eight or ten days

when the sutures are removed. Physiological rest is the most important feature of their after-treatment. Massage is begun as soon as healing is complete. Passive movement is not allowed until after the lapse of a month in ordinary cases and a much longer period in cases infected by streptococci.

In the after-treatment of compound fractures various splints are employed, depending on the type of fracture. In the femur where there are large wounds, and considerable flexion of the knee is necessary, extension can be obtained by the use of the caliper invented by Besley. The tibia and fibula are commonly treated on slightly flexed Thomas splints with the addition of a Sinclair foot-piece for extension. The Hey Groves skeleton inclined plane with foot-piece is also used. The humerus and elbow fractures are usually treated with the elbow flexed at right angles, generally from the beginning, and if not, after the first few days. In the forearm the Hey Groves open wire splint was found satisfactory.

The authors give a statistical summary of the cases treated and the results obtained.

Under the bacteriological report directions are given for collecting material and making cultures.

The number of cases treated was too small to enable the authors to form definite conclusions on points of detail, such as the value, absolute or relative, of antiseptics in the closure of infected wounds.

They have been able to confirm fully the statement made by the French surgeons, that of the organisms commonly found in gunshot wounds the hæmolytic streptococcus is by far the most virulent. Although it was found in only 15 per cent of their cases, they believe it is far more common in the later stages of open wounds. So far no antiseptic has been found that has any palpable effect on wounds infected by these organisms. It is hoped that a serum will be discovered which will give efficient protection against this type of infection.

While it is evident that with careful selection of cases and efficient operation immediate suture may be counted on to meet with a large measure of success, and while immediate suture must be the operation of choice for certain classes of wounds, such as those of the head and chest and those involving joints, yet the authors believe that for general use in the average wound delayed suture is safer and more certain in its results. During periods of active fighting delayed suture is the only means of closure possible. This method has the advantage that the presence of virulent infection can be ascertained before the wound is closed by clinical evidence and microscopical examination. In this way the infection can be treated and better end-results obtained.

G. W. HOCHREIN.

**Benians, T. H. C.: The Local Application of Liquid Glucose in the Treatment of Certain Superficial Bacterial Infections.** *West. M. News*, 1918, x, 177.

The following factors give an understanding of the principle exploited in the adoption of this method:

1. Almost all pathogenic bacteria are capable of fermenting glucose, some of them, however, much more slowly than others.

2. During fermentation a definite acidity of the medium is produced.

3. Many of the bacterial toxic bodies, using the term in its widest sense, are formed to the greatest advantage in a definitely alkaline medium, and the production of these substances is in some cases distinctly inhibited by the presence of glucose; diphtheria toxin is an instance in point.

4. Foul discharges are in most cases due to the tryptic digestion of proteins, and this is a form of enzyme action which can only go on to advantage in an alkaline substrate, and which ceases in the presence of even a slight degree of acidity.

In one case of bromidrosis it was as effective as in cases treated with glycerine.

Ozæna treated with a 25 per cent solution of liquid glucose has been cleared of the foul smell and incrustations concurrently. The final results as to permanency of cure are to be reported later. Glycerine gives better results.

Chronic otorrhœa cases seem to have varying reports as to the results.

Cases with chronic vaginal discharge were treated with douches of 25 per cent solution of liquid glucose twice a day or a glucose suppository (25 per cent with a gelatine basis) used nightly. In most cases the purulent discharge rapidly diminished, in some cases it cleared up completely and the vaginal secretions resumed their normal acid reaction. He does not assert that the condition can be cured by this means.

Two things admit of a positive statement: (1) the patient's comfort has been increased by the diminution of the discharge; (2) the normal acid reaction of the vagina has been restored.

CARL R. STEINKE.

### ANÆSTHETICS

Sweetnam, H. W.: An Experience of 50 Cases of Rectal Ether Anæsthesia. *Med. J. Australia*, 1918, i, 452.

The author regards rectal ether anæsthesia as a very valuable method, provided the proper technique can be obtained and a suitable dose given. He regards it as being as safe as or even safer than the usual inhalation methods, and believes it to be applicable to all cases from three years upward, and of especial value in all operations about the head and neck.

In toxic goiter cases he advocates its use and suggests rehearsing for a week or more before operation every detail of the technique of administration, since in this way the element of fear can be almost if not entirely eliminated.

He also believes the method of special value when it is particularly desired that no vomiting should occur, as in ventral or umbilical hernia, and he considers it the method of choice in asthenic and bad

risk cases, such as palliative gastrojejunostomy in advanced pyloric cancer.

He believes the only contra-indications to be: (1) pathological conditions in the lower bowel; (2) children under three years; (3) cases requiring operations in the Trendelenburg position.

The anæsthesia from a surgical point of view he regards as satisfactory in a majority of his cases and in many perfect, although he has not been favorably impressed with this method in abdominal work, as relaxation has not been altogether satisfactory.

The general condition of the patient during operation has been in most instances thoroughly satisfactory, and in only one case was shock of any severity noticed. In this case the shock was directly the result of hæmorrhage from a cystic artery in a woman, aged 64, suffering from empyema of the gall-bladder, on whom a cholecystectomy was being performed.

He has experienced no postoperative ill results. In 24 of his cases there has been no vomiting or even nausea, and this quite irrespective of the class of operations performed. In 25 of the patients who vomited, the sickness did not last more than three or four hours, and the average number of times they vomited was four. In one case only was there sickness as late as twelve hours. H. J. VAN DEN BERG.

Burger, T. O.: The Scope of Local Anæsthesia. *Med. & Surg.*, 1918, ii, 518.

The author believes that not every operation is adapted to local anæsthesia; not every patient is a suitable subject for it and not every surgeon is temperamentally fitted for it, even though he attempts to master the art.

A thorough and painstaking knowledge of anatomy, especially of the sensory nerve distribution, is an absolute requirement for a successful local anæsthesia; also one should be familiar with those structures that are alive to certain trauma.

The drug used is of primary importance. Burger believes that procaine is a safe, satisfactory, and easily sterilized drug and that it should be employed whenever obtainable, since it does not produce oedema, delayed healing, or invite infection.

It is important that the armamentarium should be in perfect working order. Children, as a rule, are not desirable subjects. A nerve sedative the night before the operation may infrequently be necessary.

The author is in the habit of giving one and a half hours before the time set for the operation a test dose of morphine and scopolamine hypodermically, usually  $\frac{1}{8}$  and  $\frac{1}{200}$  gr.; then forty-five minutes later he gives another dose of an amount indicated by the effect of the first hypodermic; in the next forty-five minutes the patient is carried carefully to the operating room in a psychically benumbed condition.

Assurance is given that no pain is necessary during the operation, but that the least sensation of pain is to be mentioned. The patient is made as



comfortable as possible; a drink of water or of fruit juice may be given at intervals if desired. The surgeon should be preferably seated, or at least in a comfortable position.

Burger emphasizes, in conclusion, some of the necessary requisites:

Use plenty of the anæsthetic solution. Exercise extreme gentleness, never pulling or tearing the tissues.

Have the incision long enough to approach the work without cramping or necessitating much retraction.

Secure the patient's confidence and emphasize the fact that he or she is not to be a soldier or to be able to endure to get through the operation safely.

Last but not least, the surgeon, to be successful in this work, must be a near-enthusiast, if not entirely one.

E. C. ROBITSHEK.

## SURGERY OF THE HEAD AND NECK

### HEAD

**Hutchinson, J.: The Operative Treatment of Trigeminal Neuralgia.** *Lancet*, Lond., 1918, cxcv, 12.

For epileptiform neuralgia involving the superior and inferior maxillary divisions of the fifth nerve, the only treatment which can afford lasting cure consists in operating on the gasserian ganglion. The author spares the ophthalmic division of the nerve in his operation. He employs the temporal route, with the patient seated in a dental chair.

The flap, with its base at the zygoma, is of ovoid form, small in size, and kept wholly within the hairy scalp. The dura is detached and the operator works inward toward the foramen ovale, which lies opposite to the pregenoid tubercle, and the foramen spinosum, which lies about 3 mm. behind and a little external to the exit of the inferior maxillary nerve. The middle meningeal artery is tied and divided. The dura is further raised until the ganglion with its superior and inferior maxillary branches is exposed. The latter branch is cleared as far forward as the foramen rotundum. The ganglion is removed with three lines of section, one cut dividing the lower maxillary division at the foramen ovale, another the superior maxillary at the foramen rotundum, and the third passing horizontally below the ophthalmic division, which is spared. Two small drainage tubes are left in the wound and the flap sutured without replacement of bone.

Until the last month, out of over 60 cases, the author had no mortality. Recurrence in the spared ophthalmic trunk occurred in but one patient after ten years; this was completely relieved by resection of the supra-orbital nerve.

With the opening in the skull limited to the squamous portion, and the skin incision concealed by the hairy scalp, there is no subsequent deformity.

After the operation facial paresis or paralysis of uncertain duration has occurred in a few cases on the side operated upon, probably due to detachment of the dura from the upper surface of the petrous bone and blood getting through the small openings leading to the aquæductus fallopii.

In three or four cases there has been weakness of the opposite arm and leg, apparently from

retractor pressure on the brain during the operation. Recovery from this is slow. Sometimes the result is disappointing, as the patient has after years of suffering and repeated failure of injections become a confirmed neurotic. With the complete freedom from pain and the ability to masticate solid food, the patient gains weight and vigor remarkably.

Alcohol injection is but an indifferent substitute for the operation on the gasserian ganglion. However, when the patient wishes it and fears the major operation, a careful trial of alcohol injections should be made; if this fails, excision of the gasserian ganglion should not be deferred.

V. C. HUNT.

**Wollstein, M.: An Experimental Study of Parotitis.** *J. Am. M. Ass.*, 1918, lxxi, 639.

Cats in whom the parotid gland and testicle have been injected with a bacterial sterile filtrate of the salivary secretion of children and adults in the active stage of parotitis of mumps develop a pathologic condition resembling the condition present in mumps in human beings.

After an incubation stage of from five to eight days, definite changes have been noted in the temperature, blood leucocytes and inoculated organs. The rise of temperature and the leucocytosis precede the glandular swelling, but all the changes reach the maximum at about the same time, after which they decline and normal conditions are re-established in about four weeks.

The intraparotid and intratesticular injections of extracts of normal parotid gland and testicles may cause a mild rise of temperature and leucocytosis of brief duration, but swelling and tenderness are absent. The white cells increased are the polymorphonuclears and not the lymphocytes. The injection of filtrates or normal saliva causes only a mild and brief rise of temperature, but no leucocytosis nor swelling of the glands.

The saliva of man and of inoculated cats, as well as the inoculated glands of the latter animals, were found to contain the filterable infective agent.

The virus of parotitis is most readily detected in the saliva during the first three days of the disease, less readily on the sixth day, and not at all after the ninth day. This would have a practical bearing on the question of infectivity and length of isolation period for mumps patients.

The virus was also detected in the blood of patients showing marked constitutional symptoms.

The serum of recovered cats was found to contain an immune body which diminished or even neutralized the action of the virus of parotitis.

EDWARD L. CORNELL.

**Winslow, J. R.: Report of Some Cases, Mostly Traumatic, of Serious Damage to the Nose and Accessory Sinuses, Operated upon Externally, with Excellent Cosmetic Results.** *Tr. Am. Laryngol. Ass.*, Atlantic City, 1918, May.

The author reports a number of cases of operative cure after serious injury to the face:

Case 1 was an extensive traumatism of the nose, face, and frontal sinuses due to a fall from a height. Operative cure gave an exceptional result.

Case 2 was that of a frontal empyema with extensive bone necrosis and external fistula, operated upon externally in several sittings. Cure of the condition was obtained with an excellent cosmetic result. Several interesting points were presented by this case:

1. Intranasal pathologic conditions were absent. A virulent infection seemed to have attacked the frontal sinus and uppermost portion of the bony framework of the nose without involvement of other nasal sinuses.

2. The posterior cerebral sinus wall was denuded but was hard and seemed devitalized rather than necrotic. It took 26 months for it to regenerate, but the author's judgment and the advice of colleagues was that it was better to delay than to assume the risk of removal.

3. There was marked anaesthesia of the operative field, the packing being for a long time painless, doubtless due to the devitalized bone.

4. Excellent cosmetic results were obtained.

Case 3 was a fracture of the external bony framework of the nose and the nasal septum by the kick of a mule, causing a depression of the tip of the nose and great disfiguration. Restoration of appearance and function was obtained by operation.

Case 4 was a fracture of the right nasal bone and nasal process and a portion of the orbital process by an iron rod, followed by the formation of sequestra and an abscess, with secondary infection of the right antrum. Operation brought about a cure, with a good cosmetic result. Photographs showing the excellent results were presented. OTTO M. ROTT.

**Schachner, A.: A Practical Consideration of Cerebral Decompression.** *Am. J. Surg.*, 1918, xxxii, 198.

Cases requiring cerebral decompression fall into two major classes: (1) all conditions which slowly but progressively encroach upon the intracranial space, such as cerebral tumors alone, or cerebral tumors plus internal hydrocephalus through occlusion of the sylvian aqueduct, or external hydrocephalus occasioned by diminished absorption through the subarachnoid space; and (2) those conditions in which

there is a rapid and progressive encroachment upon the intracranial space plus destructive lesions to some parts of the brain, the causative factor in this class being trauma.

A third class is also mentioned, namely, the idiopathic type of epilepsy.

In the application of decompressive measures in cases of the first class, the aim should be to afford the greatest relief possible from the increasing intracranial tension with the least interference with the nerve tracts. In the second class where the progression of symptoms is more rapid and the underlying trauma has occasioned lesions in the brain, it requires a careful study of the case to correctly interpret the rapidly changing conditions.

A gradual and progressive rise in the blood-pressure and a gradual and progressive decrease in the pulse in head injuries call for a subtemporal decompression, even though the eye does not offer evidence of papilloedema. Congestion of the retinal vessels and slight pinkish color of the discs are common attendants of head injuries and in themselves do not call for a decompression unless the changes are progressive.

Proper decompression in carefully selected cases not only affords the greatest measure of success, so far as recovery is concerned, but safeguards the patient to a considerable extent against subsequent neuroses common to head injuries. E. B. FREILICH.

**Keen, W. W., and Ellis, A. G.: Removal of Brain Tumor; Report of a Case in Which the Patient Survived for More than Thirty Years.** *J. Am. M. Ass.*, 1918, lxx, 1905.

Keen gives a somewhat lengthy summary of the case because it was his first modern brain tumor case; because it shows the technique at that time; because it was one of the earliest operations on such a tumor, following by only two years the very first performed by Godlee in 1885; and because of the great length of time between the operation and the death of the patient.

He regarded as of special pathologic interest the extensive exposure of the interior of the left ventricle for a period of thirty years. The ventricular area of the central nervous system was greatly increased, but so far as the clinical history of the case indicated, there was no symptomatology of changed intracranial pressure, either increase or decrease. He regarded the fact that the covering of the wound was depressed when the patient was in the erect posture as evidence that the pressure was increased to no apparent extent if at all. He believes that when the patient stooped and the scalp protruded, the spinal fluid must have accumulated principally in the left lateral ventricle area. At necropsy there appeared to be no increased amount of fluid, and the depression of the scalp during life he believes a proof that the wound cavity was not filled by that fluid.

He considered the question as to whether the inner surface of the wound became covered by ependyma extending from the ventricle, but this was proved



microscopically not to be the case. He believes that if, as is generally believed, the fluid is very largely the product of choroid plexus, the condition obtaining here would be of more importance from the standpoint of pressure than from production of fluid, and regards his case as one of long-standing increase of ventricular area without demonstrable clinical effect.

H. J. VAN DEN BERG.

**Lewis, F. P.: Hypophysis Cerebri and Its Morphological Influence.** *Laryngoscope*, 1918, xxviii, 604.

The author formulates the principle that the hypophysis cerebri, when normally functioning, exercises a controlling influence not only over the skeletal and muscular structures, but over the nutrition and development as well of all tissues having an epiblastic and mesoblastic origin.

He traces the effect of hyperpituitarism and hypopituitarism on body structures. One portion of the pituitary may show signs of increased activity and another portion diminished activity. These effects should be noted in the eye as well as other body structures. He cites two cases.

I. E. BISHKOW.

**Fracassi, I.: Syphilitic Diabetes Insipidus** (Diabetes insipida sifilitica). *Rev. méd. d. Rosario*, 1918, viii, 197.

Syphilitic diabetes insipidus was known to Fourier in 1871 and he considered it dependent on a syphilitic cerebral condition which injured the fourth ventricle. The subject has since been frequently mentioned in literature.

The author reviews the later developments connecting diabetes insipidus with hypo- or hyper-functioning of the hypophysis. He thinks it is now recognized that all forms of diabetes insipidus have a common origin due to a functional or organic disturbance of the hypophysis or of the cerebral polyuric centers.

In cases of syphilitic diabetes insipidus the spirochete may attack the hypophysis producing gummata or arterial lesions; but as a general rule it produces gummous or sclerogummous meningitis of the base of the brain, which is the location of choice of the microbe in this region. The meningeal process directly attacks the polyuric centers or acts upon the hypophysis, according to whichever view of the pathogenesis of diabetes is accepted.

The author gives the clinical details of a case of syphilitic diabetes insipidus in a man twenty-five years old. The symptoms yielded under mercuric injections.

W. A. BRENNAN.

## NECK

**Aikins, W. H. B.: Radium Therapy in Hyperthyroidism, with Observations on the Endocrinous System.** *Canad. Pract. & Rev.*, 1918, xliii, 235.

The author states that he has had 45 cases under treatment; of these 23 have been clinically cured,

i.e., the tachycardia, tremor and restlessness have disappeared, and symptoms of excessive thyroid secretion have abated. In 17 cases there has been an improvement, but not a complete cessation of symptoms. Four cases have passed from observation. In only 19 patients did the thyroid gland itself decrease in size, while in 6 cases there was no reduction in size although the nervous symptoms were completely relieved. In 3 cases thyroidectomy had been performed but the nervous symptoms had not diminished. This was, however, effected by radium.

In connection with the treatment of these cases, general medical measures were carried out as well. Physical and mental rest, a low protein diet, quinine hydrobromate, 5 gr. t. i. d., together with ergotin 1 gr. t. i. d. was prescribed.

In a large number of cases, all these usual medical measures had failed to relieve the symptoms and it was only when radium therapy was added that the hyperthyroidism was lessened.

The author reviews the subject of the endocrinous glands and quotes largely from Blair Bell.

L. H. LANDRY.

**Janney, N. W., and Isaacson, V. I.: The Influence of Thyroidectomy and Thyroid Diseases on Protein Metabolites.** *Arch. Int. Med.*, 1918, xxii, 174.

The endocrine glands undoubtedly play an important rôle in controlling metabolic processes. This field fascinatingly invites research study, both on account of its high scientific interest and its clinical importance. For some time past the authors have investigated the influence of the thyroid gland on metabolism. The problems investigated have comprehended the relation of the thyroid to (1) carbohydrate metabolism, (2) protein metabolism, and (3) thyroid therapy.

In the present article the influence of the thyroid on certain aspects of protein metabolism is considered. Although it has been known for a long time that the administration of thyroid preparations stimulates protein catabolism, and conversely that the abolition of thyroid function diminishes tissue breakdown, still knowledge of the influence of the thyroid on specific nitrogen metabolites such as ammonia, creatinin, and the purines has remained rudimentary. Better information is very desirable, since if one could, for example, trace the control of creatinin and purine metabolism to the thyroid or other ductless glands, the curtain obscuring an understanding of the causes of various myopathies and even gouty diathesis might be raised.

A study of the thyroid, taken as a type of the endocrine organs, on the nitrogen metabolism is therefore of considerable importance. This problem has been attacked from two chief directions: first, they endeavored to learn more about thyroid function by estimating the nitrogenous constituents in the urine of animals before thyroidectomy and then



observing the changes occurring after the operation; that is, the metabolism of experimental athyroidism. Second, the metabolism of experimental hyperthyroidism was studied by following the chemical urinary changes after injecting an overdose of the isolated thyroid hormone. Third, supplemental studies were made in cretinism and exophthalmic goiter, as types of hypothyroidism and hyperthyroidism.

As a result of these experiments the authors reached the following conclusions:

No selective action of the thyroid was observed on urea and ammonia. The percentages of these substances remained within normal limits. The amounts varied with the total nitrogen in the usual manner. The experimental studies definitely demonstrate that the thyroid exerts an influence on purine metabolism, as observations showed a decrease in the urinary purines after thyroidectomy and a marked increase in experimental hyperthyroidism; also a tendency to a low purine excretion in the cretin and a high excretion in the case of exophthalmic goiter. The clinical observations thus tend to confirm the experimental findings, but should be extended before conclusions are justified.

The behavior of the purine metabolism in hypophyseal disease seems to be analogous to that in thyroid disease. In the few cases investigated, the endogenous purine excretion is reported high in acromegaly by Falta and Nowaczynski. The same investigators found a decreased uric acid elimination in hypopituitarism (Frohlich's syndrome). The observation that the thyroid exerts an influence over purine metabolism analogous to the effect of the hypophysis is important, and further illustrates the fact which is becoming more and more apparent, namely, that several of the endocrine organs may exert very similar influences on the metabolic processes.

With regard to clinical applications, it might seem, in view of these results, justifiable to seek the cause of gout in an endocrine disturbance. So far, however, as the thyroid and hypophysis are concerned, clinical observations do not support a relation of diseases of these organs to gout. One might likewise feel inclined to administer thyroid or pituitary tablets to gouty patients in the hope of stimulating the excretion of the purines. According to the authors' views, however, this would scarcely be advisable, at least in the case of thyroid, for it is probable that the excretion of purines is increased only as the result of a toxic effect of large doses of thyroid on the protein of the tissues.

Their studies emphasize the independence of the creatinin metabolism from thyroid influence. Creatinin was not increased in the urine even when large amounts of body tissue were being broken down in experimental hyperthyroidism. This would seem to indicate that creatinin is not a direct product of protein catabolism. With regard to creatin, it is indeed strange that a product which is chemically merely hydrated creatinin should appear

in the urine while the creatinin undergoes but little change. This apparent independence of creatin from creatinin metabolism is striking. A number of previous observations have, however, shown this to occur under other circumstances.

In the thyroidectomy experiments the creatin determinations are not very valuable, as this substance is usually present in normal dog urine. However, the fact that it is found in cretinism and exophthalmic goiter deserves consideration. Creatin is usually excreted when masses of body tissue are being broken down, such as takes place in severe febrile conditions. Such is, however, not the case in cretinism. Its appearance in this condition is probably due to a disturbance in the normal synthetic metabolic processes which take place by means of intermediary chemical reactions, which are yet little understood but may be disturbances in the metabolism of carbohydrates. The creatinuria of exophthalmic goiter seems more easy of comprehension than that of cretinism, for in exophthalmic goiter there is frequently a toxin breakdown of body tissue which may be held to account for the appearance of creatin.

The present experiments do not support the view that any marked diminution of nitrogen excretion follows thyroidectomy in animals. Nor was the nitrogen output particularly low in the cretin. There are, moreover, reasons to believe that the decrease in the protein breakdown, observed by others in the cretin metabolism, is due rather to an inability for growth and repair of tissue to take place. These views will be more fully developed in the next article of this series. GEORGE E. BEILBY.

**Hernaman-Johnson, F.: The Use of X-Rays and Electricity in Exophthalmic Goiter and Other Disorders of the Ductless Glands. *Arch. Radiol. & Electrotherap.*, 1918, xxiii, 91.**

The author maintains that the roentgen ray applied in small doses at frequent intervals has a regulating action upon the quantity and quality of the thyroid secretion. This renders it of great aid in the treatment of exophthalmic goiter, especially in the early stages of that disease, although beneficial in most cases at any period of its course. The pulse-rate slows down, the tremors and sweatings diminish, and sleep improves. Visible pulsation in the neck disappears, the gland if enlarged diminishes in size to a variable degree, but the exophthalmos is but little reduced. Practically all that can be done can be accomplished in three months.

In addition to the roentgen ray the author has used a combination of electrical remedies with advantage in a number of cases. A rhythmically interrupted sinusoidal current applied to the cervical region frequently tends to lower the pulse-rate when it is refractory to roentgen rays alone. Galvanism applied to the gland may materially reduce the size of the gland. The exophthalmos also is favorably influenced by the above measures. Cerebral galvanism employed when the nervous unrest is very



pronounced, and there is persistent tremor, gives good results. Failure, when it occurs, may be due to faulty environment, absorption of poisons, or to the lack of some other internal secretion. Focal infections should be removed, and intestinal stasis excluded.

Regarding dysmenorrhœa due to hyperactivity or perverted activity of the ovaries, the author believes that the roentgen ray also has a regulating effect upon the internal secretions of those organs, and can favorably affect such a condition when no gross surgical lesion is present. Three courses of treatment are

necessary in consecutive intermenstrual periods. If decided improvement is not present after the third course, it is wise to desist.

With regard to other ductless glands, roentgen rays have been used in a few instances with variable success. Thus the pituitary gland has been rayed in certain disorders with favorable effects and the author has treated the right adrenal region in a few cases of pancreatic diabetes with temporary benefit. He believes the future holds promise of progress in this line of therapy.

ADOLPH HARTUNG.

## SURGERY OF THE CHEST

### CHEST WALL AND BREAST

**Rouviellois, H., and Guillaume-Louis: Primary Operations in Chest Wounds** (À propos des opérations primitives dans les plaies de poitrine). *Bull. et mém. Soc. de chir. de Par.*, 1918, xlv, 1148.

Early in 1917 the authors were converted to the idea of early operation in wounds of the chest, not questioning its necessity in open wounds but proceeding more timidly in the case of closed wounds. The indications in the latter class of cases have become more manifest with time. They have generally adopted Duval's theory that thoracic wounds ought to be treated as other wounds of war.

They give short histories of 12 cases of closed thoracic wounds with included projectile in which they operated following the recognized technique: resection of fractured ribs or incision in an intercostal space; opening the pleural cavity; following the projectile trajectory, exteriorizing and examining the lung and removing all foreign bodies; cleansing and lavage the traumatized area; closure. Anæsthesia requires very expert attention, but otherwise the technique is simple.

There is a special difficulty, however, in the methodical application of the routine measures of war wound surgery to these cases, and this arises from the fact that while a thorough mechanical disinfection of the tract of a projectile necessitates radical and massive excision of injured tissues, this is not always realizable for obvious reasons in lung tissue, and the disinfection of the projectile trajectory must be in many cases incomplete. It is to this incomplete disinfection of the tract that many postoperative pleural infections are due, as well as the bronchopneumonia to which many patients succumb.

In the 12 cases operated upon by the authors there were 4 deaths. These occurred in very serious cases and the deaths could not in any way be attributed to the operation, but were rather in spite of it.

W. A. BRENNAN.

**Norris, R. C.: The Prevention of Mastitis.** *Am. J. Obst.*, N. Y., 1918, lxxviii, 46.

Norris states that the problem of caring for the breasts properly, which is the prevention of breast

complications of the puerperium, is distinctly a "nurse problem" and he particularly denies any efficacy in treating mastitis by the breast pump and massage. He strongly advocates the application of heat to the infected breast, employing the ice-bag only in the early treatment of the diffuse subcutaneous variety. "The use of an ice-bag is a confession of inefficient prophylaxis and the occurrence of infection, which almost always should have been prevented."

The essential features of the prophylactic care of the breasts of nursing mothers he sums up as follows:

1. Surgical cleanliness daily carried out with as much care as for preparation for an operation on the breast.
2. Rest, planned for the nipple and for the breast as is done for other organs that must functionate although temporarily crippled.
3. Dry and moist heat and pressure, properly utilized for their well-known hydro- and mechanico-therapeutic values. The means of utilizing these principles are the lead shield, hot-water bags or hot compresses, and the mammary binder.

CAREY CULBERTSON.

**Moschowitz, A. V.: The Treatment of Diseases of the Costal Cartilage.** *Ann. Surg.*, Phila., 1918, lxxviii, 168.

The author gives a somewhat detailed account of his own experience with these cases and cites cases reported by Axhausen and Roepke. After a careful study of the matter he concludes that:

1. Diseases of the costal cartilages may be caused by any one of the pus-producing germs.
2. The infection is caused most frequently by the tubercle bacillus; next in frequency appears to be the typhoid bacillus.
3. Cartilage exposed in an infected wound does not heal, and practically always forms a sinus.
4. Given the same conditions, i.e., exposed cartilage, plus infection, a relapse is almost certain to occur, even if a portion of the diseased cartilage has been excised, apparently well beyond the infected area.
5. If the conditions are favorable, i.e., in the absence of, or with only very slight infection, the

operating surgeon may take the risk and close the wound entirely; under no circumstances should a wound of this nature be drained, and least of all with gauze.

6. The most certain procedure is to remove the offending cartilages throughout their entire extent, so that not even a trace of exposed cartilage is visible in the wound. If any portion of the sixth, seventh, eighth, ninth or tenth costal cartilages are diseased, it is necessary to remove all these cartilages *in toto*, in order to bring about healing.

H. J. VAN DEN BERG.

**Meyer, W.: Postoperative Thoracic Drainage.** *Ann. Surg., Phila.*, 1918, lxxviii, 156.

The author, after a somewhat exhaustive review of this subject, gives the following conclusions:

1. Thoracic operations, the same as operations in other parts of the body, often demand drainage.

2. With no adhesions present between the two pleural leaves, an acute postoperative pneumothorax is the inevitable consequence if an ordinary drain, rubber, cigarette, or gauze, is introduced. The occurrence of a complete pneumothorax after operation greatly enhances the dangers confronting the patient during the after-treatment.

3. It is, therefore, necessary to avoid this complication. This could hitherto be accomplished either by leaving the patient under the influence of differential air-pressure for a greater period of the first twenty-four hours following the operation, after having closed the thoracic wound and then covered the drain ends outside with a large piece of rubber dam, or by making use of Tiegel's thoracic metal drain. Both methods have been tried and found satisfactory; both, however, for the question here under discussion, have certain drawbacks.

4. Kenyon's method of postoperative drainage fulfills Sauerbach's demand that the thorax be closed air- and water-tight after intrathoracic operations. Yet it permits of draining off in an efficient manner the secretions of the pleura which follow the majority of intrathoracic operations, and usually are not sterile. Kenyon's method is described as follows:

"After proper local preparation, the aspirating needle proves the presence and location of the pus. It is left in place. Alongside the same a narrow-bladed knife is inserted between it and the upper margin of the rib below, until it penetrates the pleural cavity. A short incision is made, the knife withdrawn and replaced by an artery clamp. After removal of the needle, the branches of the clamp are spread and the drainage tube crowded in. It passes through a button-holed piece of tape which is fastened to the chest wall with adhesive plaster and prevents its slipping out, while a rubber cuff over the tube takes care of its not slipping in farther. The end of the tube is connected with a bottle underneath the bed the same as when draining other cavities of the body."

5. The introduction of Kenyon's method of drainage, therefore, bids fair to mean a long step forward in the evolution of thoracic surgery. It greatly adds to the safety of intrathoracic surgical work, and should, for the present at least, be employed after every operation upon the thorax in which the free pleural cavity, particularly a "virgin-pleura", had to be transversed.

Summarizing, the author believes that at the present moment the successful issue of surgical work within the thorax seems best assured by combining immediate, complete closure of the incision with an efficient method of simple and safe drainage of fluid and air, without allowing the latter to regurgitate into the chest.

H. J. VAN DEN BERG.

**Rinehart, S. M., and Oelgoetz, A. W.: The Treatment of Empyema by Frequent Aspiration and the Injection of a Solution of Formaldehyde and Glycerine.** *J. Am. M. Ass.*, 1918, lxxi, 274.

At Camp Sherman in a series of cases of pleural effusion, aspiration of fluid was performed as soon as diagnosed without waiting for symptoms of sepsis. The aspiration was immediately followed by an injection of 2 per cent formalin solution in glycerine. Further aspiration and injection was done as soon as fluid reaccumulated.

A large caliber needle was used and no untoward effects occurred. By this method the authors claim patients get well more quickly than by thoracotomy or rib resection. They think the method should be tried first and rib resection can be done later if indicated. Protocols of pus aspirated and bacterial counts in two cases are included.

C. A. HEDBLUM.

## TRACHEA AND LUNGS

**Roy, D.: A Carpet Tack in the Right Bronchial Tube of a Patient for Two Years with No Pathologic Symptoms; Exhibition of Plates.** *Tr. Am. Laryngol. Ass.*, Atlantic City, 1918, May.

This occurred in a woman aged twenty-eight years. X-ray showed the tack in the right bronchus between the seventh and eighth ribs. Its removal was at once attempted by upper bronchoscopy and failed. Tracheotomy was performed the next day, the bronchoscope passed, but it was impossible to grasp and dislodge the tack. The tracheotomy wound was allowed to heal.

Five months later a bronchoscope was easily introduced by upper bronchoscopy. The tube was too short and the foreign body could not be removed.

The patient has been entirely well and has increased in weight since that time, two years having now elapsed. X-ray photographs show the tack still *in situ*.

The author presents records of a number of cases of this character, many of them producing no untoward symptoms.

OTTO M. ROTT.



**Petit de la Villeon: Posterior Thoracopneumotomy Under the Radioscopic Screen for Extraction of Projectiles from the Region of the Hilum of the Lung** (La thoraco-pneumotomie postérieure, radio-opératoire, pour l'extraction des projectiles inclus dans la région hilare du poumon). *Bull. et mém. Soc. de chir. de Par.*, 1918, xliv, 976.

Petit de la Villeon has extracted 16 projectiles from the hilum region of the lung with success in all cases, operating under radioscopic screen control so as to avoid all possible operative traumatism.

The author considers the posterior the best route of access to the hilum. Under radioscopic control he operates through an incision between the scapula and spine. The operation is done in three stages. In the scapulo-vertebral space only the rib which bars the road to the projectile is resected, the sixth, seventh, or eighth, according to the case; the resection is extended to make a breach 8 to 10 cm. long in the posterior thorax. The scapula is not resected but is basculated and its lower angle displaced outward. The parietal pleura is opened slowly and a gradual total pneumothorax results. The lung is exposed. This is done in full orange-red radio-light. In the second stage of operation the projectile is located by the X-rays and seized with a forceps. The extraction is finished and the rest of the operation done in full daylight.

In his 16 cases Petit de la Villeon has had no hæmorrhage. He is certain that the pneumothorax aids hæmostasis.

Faure strongly advocates radioscopy as giving the surest results in the search for projectiles. He also prefers the author's posterior route as preferable to the anterior. The latter is more traumatizing, more liable to cause pleural infection, and drainage facilities are not so good. The posterior route under radioscopy seems in every way preferable.

W. A. BRENNAN.

**Holmes, G. W.: A Case of Multiple Abscesses of the Lung with Spontaneous Cure.** *Am. J. Roentgenol.*, 1918, v, 344.

A full record of the case, both clinically and roentgenologically, is given. After a history of two weeks' illness in which the symptoms were those of an acute chest infection, a plate of the chest on October 10 revealed an area of increased density in the upper right. There was no mottling in this area of increased density, but the linear markings to the hilus were accentuated. At this time, the patient showed practically no physical signs.

A plate made six days later, October 16, after the patient had raised a considerable amount of sputum, showed the area of increased density lessened in amount and the center of the area showing lessened density, which suggested cavity formation. At this time, physical findings were still slight.

A plate on November 6 showed the upper right pathology largely disappeared, but a new area of

involvement on the same side between the third and fourth ribs in front. The lung markings to the hilus from this area were accentuated, as in the case of the markings from the original focus in the upper chest. November 22 the second area showed accentuation, while the first area was entirely cleared up.

November 27, following the last plate, the patient had a feeling of something giving way in his chest, following which he coughed up two ounces of foul, purulent material. This last plate showed the second area of density much less in extent. As in the case of the original focus, there was a suggestion of cavity formation. On December 5, the second process had practically cleared up.

The diagnosis was multiple abscesses of the lung.  
W. A. EVANS.

## HEART AND VASCULAR SYSTEM

**Duval, P., and Barnsby, H.: A Bullet Movable in the Pericardial Segment of the Lower Vena Cava; Extraction by Pericardotomy and Incision of the Vena Cava** (Balle de fusil mobile dans le segment péricardique de la veine cave inférieure; extraction par péricardotomie et incision de la veine cave). *Bull. et mém. Soc. de chir. de Par.*, 1918, xliv, 1138.

In a soldier who had been shot in the axillary line at the seventh left rib, radiologic examination showed the bullet freely movable in the region of the heart and inferior vena cava. Since there was a left hæmothorax and the bullet was at the right side of the sternum, it seemed very undesirable to open the left pleura. Moreover, the probability of having to operate on the vena cava made it desirable to have access to the lower region.

Duval operated, assisted by Barnsby, and a new technique was employed. A vertical median presteral incision was made from the fourth rib to the middle of the umbilicus, a sterno-epigastric incision. Detaching the linea alba from the xiphoid, the finger glides to the posterior face of the sternum and ascends as far as possible, detaching the bone from the pericardium and the two pleural cul-de-sacs. The sternum is then split along the middle line from below up with a chisel as far as the fourth rib, then in the fourth space, scissors cut the sternum transversely so that it is entirely divided by a T-incision into two perfectly mobilizable flaps.

A retractor is then applied. It is quite unnecessary to fracture the ribs to fold the flaps back, as the elasticity of the cartilage is sufficient. The whole space opens like a book. The pericardium and the pleural sacs can easily be detached without opening them. With a few maneuvers the operating field is so enlarged that the two hands can easily work on the heart after incising the pericardium along the middle line. This thoraco-abdominal incision gives an extraordinary amount of light, it spares the pleural sacs, exposes the heart, the large vessels, and the base of the heart, and gives a minimum of operative mutilation.



In the case under operation, after a number of radioscopic attempts to locate the projectile it was finally found to be in the vena cava but constantly moving owing to the force of the blood stream. It was finally excluded in an auricular fold, the extremity of the vein. A few purse-string sutures were made around it and the sac thus made incised. This was at the juncture of the vena cava and the auricle and rather on the vein. The bullet was extracted. There was only a slight loss of blood. The sutures held quite staunch, and the operative wounds were closed. During the maneuvers the heart continued to beat without manifest disturbance, the rate being 104 at the end of the operation. The whole operation lasted thirty-five minutes. The patient was up the ninth day after operation.

The authors draw attention to the fact that the projectile was movable in the vena cava, migrating between the suprahepatic veins and the right auricle. It had perforated the left ventricle, the intraventricular partition, passed through the auriculoventricular orifice, and reached the vena cava. It is the first case, the authors believe, in which a projectile was movable in this vessel and in the heart. It was kept in equilibrium by the force of the venous flow like an egg supported by a jet of water.

The authors also draw attention to the excellent results obtained by thoracotomy as a route of approach to the heart.

W. A. BRENNAN.

#### PHARYNX AND ŒSOPHAGUS

Judd, E. S.: *Œsophageal Diverticula. Surg., Gynec. & Obst.*, 1918, xxvii, 135.

Judd differentiates between dilatations and diverticula in that the former involve all of the structure of the Œsophagus, while the diverticula are only in reality herniæ, involving the mucous membrane and submucosa which project through the muscular coats.

He divides diverticula into two types: traction and pressure diverticula. In traction diverticula, the distortion is due to a pulling force acting from the outside of the Œsophagus, and generally occurs at a point where the Œsophagus crosses the left bronchus. Most often it is due to the contractions of a cicatrix formed by the healing of a suppurating lymph-gland.

Diseases of the pleura and lung, adhesions of the thyroid when there is marked cystic degeneration, mediastinitis, and caries of the vertebræ, have all been cited as etiologic factors in producing this form of diverticula. The diverticula are often multiple.

Traction diverticula usually produce no symptoms and have no surgical importance, according to the author. Usually in these, the apex is higher than the base so that food particles or mucus can accumulate; however, in those cases in which the apex has been so low as to allow accumulations of food particles, the traction-pulsion diverticula sometimes attain to a considerable size, usually even then without presenting symptoms.

At the present time, pulsion or pressure diverticula can be readily and accurately diagnosed and are ame-

nable to surgical treatment. These diverticula are always located in the cervical region in the unsupported Œsophageal wall and at a point directly opposite the cricoid cartilage, this being the weak point in the arrangement of the musculature at the junction of the pharynx with the Œsophagus. There is a physiologic narrowing at the level of the constrictor muscle and a hiatus exists in the longitudinal muscle. In most of Judd's cases this opening was posterior and the sac was usually present on the left side. The etiologic factor in these pressure diverticula has never been definitely shown, but it has been shown that the pressure in the Œsophagus was greatly increased during deglutition.

The first symptoms of this condition are usually dryness of the throat and a scratchy feeling as though a small foreign body were present; these sensations make it difficult for a person to swallow. Nausea follows, mucus is raised from the throat, and later particles of undigested food are brought up. Difficulty in swallowing was noted in all of Judd's cases, while 30 out of the 35 patients complained of regurgitation of food. A gurgling noise in the throat was present in 12 of his cases. A feeling of pressure, symptoms of stricture, and choking sensations develop.

Symptoms of an Œsophageal diverticulum rarely present themselves before the patient is forty-five years of age. The average age in this series of 35 patients when they came for treatment was fifty-four years; the average duration of symptoms was five and a half years.

A visible, palpable tumor of the neck occurs only when the sac is large, and in the cases formerly reported this occurred in about 30 per cent. Ten of Judd's patients had a visible palpable tumor of the neck; in seven of these the tumor was on the left side and in three on the right side. The weight loss is greater in case the sac is large or so shaped as to close the lumen of the Œsophagus. In some of his cases the obstruction was almost complete. In some of the extremely emaciated patients it seemed best to perform a gastrostomy before attempting any treatment of the diverticulum. A preliminary gastrostomy, Judd believes, is seldom, if ever, necessary.

The size of the sac of the diverticulum varies greatly. The opening into the Œsophagus may be small or as large as the lumen of the Œsophagus. A diagnosis can practically always be made by means of the X-ray taken after swallowing a bismuth mixture.

The method of treatment is surgical and should be made as conservative as possible. It consists of either obliteration or removal of the sac. In extreme cases it is always necessary to put the patient in as good a general condition as possible before attempting any treatment for the diverticula. When the diverticulum is small and has a large opening communicating with the Œsophagus, dilatation with large sounds will, in some instances, relieve all symptoms, while in others this method of treatment may be preferable to the more radical excision, especially if there is any contra-indication to the open operation.



The author believes whenever the infolding operation as described by Bevan can be performed, it is the operation of choice; but where the diverticulum is very large and reaches down into the thorax, it would seem preferable to use the two-stage operation as devised by C. H. Mayo. These operations can be performed with practically no mortality.

The article gives complete tables of the different kinds of diverticula, and symptoms and types of operations in the author's series. E. C. ROBITSHEK.

**Sencert, L.: Treatment of Severe Cicatricial Stenoses of the Œsophagus** (Traitement des rétrécissements cicatriciels graves de l'œsophage). *J. de chir., Par.*, 1918, xiv, 553.

The author says that in strictures of the œsophagus, it frequently happens that œsophagoscopy will not enable the upper orifice of the stricture to be found; or even if this orifice is found and freed, catheterization of the stricture is not effected simply, easily, and constantly. In such cases the stricture may be considered a severe one and the indications are to renounce attempts to treat the stricture from above downward and to discontinue repeated catheterizations. Dilatation from below upward after a gastrostomy and a thorough radioscopic examination is recommended by the author as the method of choice.

Gastrostomy according to Sencert is a simple operation without danger when done in a non-cancerous patient under local anæsthesia, and when the gastric fistula is placed in the fundus of the stomach near the small curvature and as close to the cardia as possible. Such a fistula will be generally patent.

This gastrostomy is the first stage of the author's technique. Its purpose is not the alimentation of the patient but is to provide a route of access to the

lower orifice of the œsophageal stricture. Even if there is some temporary incontinence, it is of secondary importance. The important point is that the orifice should be large enough to give ample approach. It is effected by a vertical incision along the external edge of the rectus and encroaching on the costal border; or by an oblique incision parallel to the costal border, opening the peritoneum and locating the stomach. The stomach is drawn into the wound and fixed to the upper angle of the abdominal incision. An incision of one to one and a half centimeters is then made in the stomach and the mucosa fixed to the skin without trying to make a canalicular trajectory or a valvular mucosal orifice. This operation can be done in a few minutes.

In the second stage of the operation a bougie is passed by the mouth, maneuvered through the stricture, and pushed to the stomach. At its buccal extremity a No. 3 or No. 4 silk thread is fixed. The finger is introduced into the gastrotomy orifice and the end of the bougie found; it is pulled through, followed by the thread which acts as a guide for the subsequent upward dilatation of the stricture. This latter is accomplished by means of an attached rubber tube to the gastrotomy end of the silk thread, a further thread being attached to the end of the tube; the tube is then drawn up by traction on the buccal end of the string. Dilatation of the stricture is thus effected. The tube is left in the strictured lumen for varying intervals, and in subsequent treatments the size of the tube is successively increased until the normal size of the strictured lumen is attained.

Prior to the war the author had treated 12 patients with severe strictures in this way with entire satisfaction. He has recently treated 2 more and the full details of these cases are given with particulars of the technique. W. A. BRENNAN.

## SURGERY OF THE ABDOMEN

### ABDOMINAL WALL AND PERITONEUM

**Benoni, F.: Gunshot Wounds of the Abdomen** (Ferite d'arma da fuoco dell'addome). *Gazz. d. osp. e d. clin.*, Milano, 1918, xxxix, 413.

The clinical data of greatest importance with regard to operation in the case of abdominal wounds, according to Benoni, are the pulse-rate and the characteristic abdominal rigidity. As a general rule, if the pulse is greater than 120, it is extremely difficult to save a patient with intestinal perforation. The pulse constantly accelerates as the time advances from the period of injury. The meteorism and paralysis of the abdomen give important indications.

According as the injury is in the colon, small intestine, or stomach region, the danger is in a descending order of gravity. The reason for this, according to the author, is to be found in the blood

supply, as the degree of resistance of an organ to infection is directly proportional to its blood supply.

The author does not believe that a projectile remaining permanently in the abdomen is of particular importance. His recovered patients with retained projectiles exhibited no later disturbances.

The treatment followed is as follows: antitetanic injection; X-ray examination; laparotomy and treatment of lesions; suture; drainage according to indications. The postoperative treatment consists of ventral ice-pack; hypodermoclysis; fasting; a little milk after twenty-four or thirty hours; removal of sutures after the eighth day.

Of 11 cases with penetrating wounds operated upon, 7 recovered, 3 died, and in 1 the result was unknown. Four wounds were visceral, 1 thoraco-abdominal, 2 were in both the large and small intestines, one in the large intestine, one in the small intestine, one omental, and one in the liver.

Fæcal intoxication, peritonitis and shock are the usual causes of death. Thoraco-abdominal wounds are extremely grave.

■ If there is any doubt about an intestinal perforation, the case should be operated upon; but the probability of a good result from laparotomy rapidly diminishes after six to ten hours. W. A. BRENNAN.

**Quain, E. P., and Eggers, C.: Painful Abdominal Scars.** *Mil. Surgeon*, 1918, xliii, 195.

From observations on army cases with pain in and about an abdominal scar, often deep-seated or radiating to the back and pointing to pathological conditions following operation, the authors concluded that the causes producing painful scars are: (1) simple adhesions of the omentum or gut to the parietal peritoneum under and surrounding the scar; (2) small submucous herniæ of omentum through the peritoneum; (3) thin stretched-out scars with hernia-like bulging of the abdominal wall; (4) retention of the appendix with adhesions following drainage of an appendiceal abscess.

A fifth cause not so clearly demonstrable in the cases under observation is the inclusion of nerve fibers in the scar. Excision of the scar cures these cases. Cases coming under the classifications 1 and 2 were probably due to faulty technique during the operation. H. H. FREILICH.

#### GASTRO-INTESTINAL TRACT

**White, F. W.: Effect of Stimuli from the Lower Bowel on the Rate of Emptying the Stomach.** *Am. J. M. Sc.*, 1918, clvi, 184.

It has already been shown by Cannon and others that irritation of the colon may delay the emptying of the stomach, especially when powerful stimuli occur in intestinal injury such as cutting, drying, or handling the bowel. Here there is a definite protective mechanism holding back food until some measure of healing occurs below. The results of a series of experiments enumerated here point definitely the same way. In regard to frequency, delay in emptying the stomach is the exception and not the rule in lesions of the lower bowel. Regarding the kind of irritation, a strong stimulus is needed from the lower bowel to slow the stomach.

The progress of a barium meal was observed with the roentgen rays and fluorescent screen in men and in cats, avoiding such factors as emotion and trauma as much as possible. Irritants were injected through the rectum under the fluorescent screen.

The effect of mechanical filling or distention of the colon had little or no effect upon the emptying of the stomach. Food passed steadily through the pylorus while the enema was retained and the stomach was entirely empty within the normal period in each of the ten cases examined. In a series of cases where there was definite or marked delay in emptying the small intestine or stasis in the ileum, the stomach emptied promptly. The pyloric spasm is variable and uncertain and has

little constant effect on function. Smithies found persistent gastric retention in only a little over 3 per cent of pyloric spasms associated with appendicitis and cholecystitis. Intermittent retention was frequent and usually disappeared after removal of the appendix or gall-bladder.

The effect of chemical irritation of the bowel was tested out in cats by means of turpentine oil, croton oil, and mustard oil being injected through a well oiled catheter. According to the degree of irritation in the cæcum the following results were obtained: (1) Intense irritation caused prompt reverse peristalsis in the stomach with vomiting of its whole contents; (2) marked irritation caused either delay in emptying the stomach up to about twice the normal time, evidently due to spasm of the pylorus, or hyperperistalsis and rapid emptying of the stomach and the whole digestive tract; (3) moderate or slight irritation had no effect on the emptying of the stomach. A perfect gradation of results was not obtained evidently because of the part played by spasm, which was very variable.

Data in another group of intestinal cases in which disease is present show delay in emptying the stomach after a barium meal to be the exception and not the rule. In 7 cases of chronic colitis and 3 cases of tubercular ulceration of the colon there was no delay. In 5 cancers of the colon there was no delay. In 5 cancers of the colon causing more or less obstruction, 2 of the cæcum and ascending colon, 2 of the transverse colon, and one of the sigmoid, there was no delay. In one case of chronic intussusception of the ileum one foot above the ileocaecal valve there was no delay. There was little chance to study acute appendicitis because early operation is needed.

Peritoneal involvement is important, as is the element of pain; even such a lesion as fissure of the anus if very painful may cause delay and a good-sized six-hour residue in the stomach.

Clinical and experimental observation in lesions and irritation of the upper bowel (duodenum and jejunum) have shown that they often delay emptying of the stomach.

Evidence indicates that delay in emptying the stomach is the result of impulses through the vagus causing pylorospasm, not inhibition of the motor fibers of the stomach through the splanchnic nerves. The delay in emptying the stomach caused by spasm of the pylorus is very variable, present one day and absent the next, under similar conditions. In general, marked delay in emptying the stomach is far more often the result of actual lesions about the pylorus than of reflexes from the bowels.

I. W. BACH.

**Baetjer, F. H., and Friedenwald, J.: Certain Clinical Aspects of Peptic Ulcer with Special Reference to Roentgen Ray Diagnosis as Observed in a Study of 743 Cases.** *Bull. Johns Hopkins Hosp.*, 1918, xxix, 177.

At the meeting of the Association of American Physicians in 1912, Friedenwald presented a paper



on a clinical study of 1,000 cases of ulcer of the stomach and duodenum, and again in 1913 he presented studies on the value of the X-ray in the diagnosis of the affection. Since then a further series of 743 cases has been studied by the authors; not only have these cases been followed clinically, but a careful X-ray study was made in every instance. The method followed was identical with that published in their former paper. The cases were first gone into clinically, and then without any note being given as to the nature of the disorder, were sent for X-ray examination. The two reports were then placed side by side in order to determine how closely the clinical and X-ray diagnoses corresponded.

The 743 cases may be divided into three groups:

Group 1. Cases in which there was an operation, and in which the diagnosis was definitely proven.

Group 2. Cases which presented such typical clinical symptoms, as well as positive X-ray signs of peptic ulcer, that the diagnosis was positive.

Group 3. Somewhat doubtful cases which presented many of the signs and symptoms of ulcer, but lacked some important signs. In the larger number of these cases the X-ray findings were quite definite.

From the study and analysis of this large group of peptic ulcers the following conclusions are drawn:

1. The X-ray offers most valuable assistance to the diagnosis of peptic ulcer, and although this method is not yet sufficiently well developed to be relied upon alone without entering into the clinical aspects of the disease, it is of the greatest diagnostic help in obscure cases. Positive X-ray findings are noted in about 84 per cent of cases of peptic ulcers and in 79 per cent of cases operated upon.

2. In duodenal ulcer there is excessive hypermotility of the stomach with rapid evacuation of the contents, so that the greater portion is extruded within the first half hour; there is hypermotility of the duodenum with formation, usually, of a deformity which remains fixed in all of the examinations.

3. The diagnosis of gastric ulcer is dependent upon two conditions, namely, the functioning of the stomach, and the finding of the filling defect. It is only when the filling defect is situated along the anterior surface of the stomach and along the anterior surface of the lesser and greater curvatures that it can be demonstrated. On the other hand, it matters not what the situation of the ulcer, the functions of the stomach are materially affected. In this condition there is an excessive irritation from the ulcer, with consequent hypermotility and a spastic condition of the pylorus, so that for the time being there is practically no expulsion of bismuth. It is only when the spasticity relaxes that a portion of the bismuth is expelled. In gastric ulcer, wherever its situation, there is always a certain amount of retention of contents. There is always a more or less marked hour-glass formation.

According to their observations the functional signs are often as important as the presence of the filling defect in arriving at definite conclusions, inasmuch as in 8 per cent of the cases, although there

were no defects found, the functional changes pointed definitely to ulcer.

4. The greatest difficulties arise in the diagnosis of complicated cases; that is, when adhesions are present. These so frequently mask the usual findings that it is often impossible to determine whether there is really an ulcer of the stomach at hand or a lesion of some other organ. When the ulcer is situated at or near the pylorus, signs of partial obstruction frequently aid in establishing the diagnosis.

5. The X-ray affords an almost absolute means of differentiating between gastric and duodenal ulcer.

6. By means of the X-ray examination the presence of ulcer can generally be ruled out.

7. The degree of healing can be approximately determined, as well as recurrence of an ulcer which can not be as certainly determined in any other way.

8. One can obtain sufficient evidence as to the extent and induration of the ulcer and degree of obstruction to serve as a guide for the necessity of surgical intervention.

GEORGE E. BEILBY.

**Hands, S. G.: Medical and Surgical Treatment of Peptic Ulcer.** *J. Iowa St. M. Soc.*, 1918, viii, 287.

The relative values of medical and surgical care of peptic ulcer are considered. From a review of the literature and the opinions of the best clinics, the author favors surgical treatment for the following reasons:

1. Possible error in diagnosis between peptic ulcer and frank surgical conditions.

2. Liability to hæmorrhage and perforation; to recurrence; to malignant degeneration; to deformities of the stomach following the healing of the ulcer.

3. The greater mortality in patients medically treated than in those surgically treated.

4. The higher percentage of cures in operated cases over those medically treated. I. E. BISKOW.

**Doolin, W.: Acute Dilatation of the Stomach.** *Brit. J. Surg.*, 1918, vi, 125.

Doolin gives an extensive review of the literature on acute dilatation of the stomach, going back as far as the work of Miller and Humby in 1853. Two cases have come to his notice, one occurring in a woman in the middle forties while being operated upon for a myoma of the uterus.

As the surgeon was about to close the abdomen the patient showed signs of respiratory distress, the abdominal walls began to bulge, and the lower border of the stomach appeared in the upper margin of the wound. The gastro-epiploic veins and their tributaries were enormously engorged. A stomach tube was passed, whereupon a large quantity of gas was brought off, followed by a fair quantity of fluid. This relieved the condition, and the stomach receded into the epigastrium. The tube was left *in situ*, the abdomen closed, and the patient brought back to bed and placed on her right side. There was no recurrence of the dilatation and the patient made an uneventful recovery.

The second case was a woman of nineteen, who

two days before admission had been suddenly seized with violent epigastric pain. Seven or eight hours later she commenced vomiting, which continued incessantly during the night. Her bowels moved normally once before vomiting set in. The next day a doctor was called, who administered an enema; this gave a good result. However, she continued to suffer pain and to vomit large quantities of yellowish-green fluid, sour to taste, with an offensive odor coming up incessantly, despite the fact that no food had been taken for thirty-six hours. She was then sent to the hospital.

The abdomen was enormously distended, with a marked prominence below and to the left of the umbilicus. This protrusion was exquisitely tender to the touch and highly tympanitic. During the examination, which lasted nearly half an hour, there were three distinct crises of visible peristalsis, the waves passing from the left above, downward, and to the right. Succussion splashing was very marked below the umbilicus. The patient had not passed urine for twenty-four hours.

The patient was placed in bed with the foot raised on a chair. She was placed prone on her face, with a large pillow beneath the pelvis. Nutrient enemata with brandy were administered every three hours during the night and a subcutaneous saline was given under the breasts. By morning the stomach distention had receded and there was no pain or vomiting. She made an uneventful recovery.

These two cases led the author to look up the subject in the literature and from his studies he has made the following conclusions:

1. Acute dilatation of the stomach is a clinical entity of more frequent occurrence than the textbooks would lead one to believe. It may arise after any abdominal operation, or in the course of a long illness.
2. Gastric retention is the primary condition; in about 25 per cent of cases duodenal obstruction supervenes as a secondary phenomenon.
3. Gastric atony is necessary for its occurrence; the primary distending agent is most probably gas, due to air-swallowing during narcosis.
4. Early recognition of the condition and prompt use of the stomach tube will suffice to prevent the secondary duodenal obstruction. Operative intervention for the relief of the fully developed condition is unnecessary and futile in the majority of cases.
5. The use of the prone position, and a replacement by intravenous saline solutions of tissue fluid depleted by vomiting has saved many apparently desperate cases, and should be adopted as a routine procedure.
6. The etiology of the condition is as yet obscure; further study along the lines of experimental physiology is necessary.

G. W. HOCHREIN.

**St. George, A. V.: Congenital Intestinal Obstruction, with Report of a Case.** *Am. J. Dis. Child.*, 1918, xv, 354.

The author points out that although the standard works on embryology, anatomy, pathology, and

pediatrics seldom refer to the interesting condition of congenital obstruction of the small intestine, isolated case reports are not infrequent.

In an extensive search of the literature the author has found a total of 143 cases of all kinds of congenital obstructions of the small intestine. He quotes Rowland, who reported one case and mentioned four others which at operation showed a complete twist of the mesentery of the small intestine. Rowland says that inspissated meconium may cause complete obstruction, which may be fatal or spontaneously relieved. Holt believes congenital syphilis to be an important factor.

The author reports a case of his own. He agrees with Kreuter's theory, as do also Quain, Bailey, Miller and Fossner, that there is absence or imperfect development of the lumen of the intestinal canal at a certain time in the development of the embryo (thirty to sixty days); that at first the intestine is hollow, but as a result of hyperplasia of the lining epithelium, temporary closure results, which in the normal fetus reopens. Failure to reopen gives various types of atresia or stenosis. He believes that, considering the embryologic development of the intestine, this process will account for a considerable number, if not the majority, of the cases.

He also quotes Schwalbe, who noted that in high stenosis the abdomen is retracted and in low stenosis the abdomen protrudes; also Pfundler and Schossman, who mention abdominal pain, obstinate constipation, deficient flatus, uncontrollable vomiting (at first food, and later mucus, bile, and blood), meteorism, purposeless visible peristalsis, intestinal spasticity, tumor (Nothnagel's phenomenon), and finally collapse.

H. J. VAN DEN BERG.

**Morison, R.: A Case of Intestinal Obstruction; with Comments on Bursts of the Intestine.** *Brit. J. Surg.*, 1918, vi, 135.

The author cites a case of intestinal obstruction and in connection discusses the etiology of bursts of the intestine.

The patient, a man of sixty-six years, was admitted to the hospital February 21, 1918. Since the age of twenty he had had stomach trouble at frequent intervals. During the attacks he vomited and had some epigastric pain, but never vomited or passed blood. The attacks were always cured by rest and freedom from worry. For thirteen years previous to the present illness he had been more than usually well.

The present trouble began in the early months of 1917, and seemed to be of the same nature as the previous attacks. Digestion gradually became worse and about six weeks before admission additional pain augmented the digestive disturbance. On five occasions after dinner at night he had been attacked by paroxysmal pain. After going to bed a feeling of distention followed by a violent pain developed. The pain always began at the umbilicus and sometimes spread to the right side, but never reached as high as the costal margin. It was accompanied by loud rumblings of wind and inability to pass flatus.



When this could be accomplished, relief came. Otherwise each attack lasted for about two hours and ended in vomiting the food which he had taken. This and a hypodermic injection of morphia gave relief. The following day after an attack his health was as usual. The last attack occurred two weeks before admission.

Examination of the abdomen showed an indefinite but very tender nodule deep in the right iliac fossa, above and internal to the position of the appendix. Once a spasm of increased peristalsis was felt and a rumble heard, but nothing else was found. Morison was of the opinion that the patient had a malignant stricture of the intestine. X-ray examination and a bismuth enema, however, excluded malignant stricture of the colon. A bismuth meal followed by X-ray examination showed apparently normal passage of the stomach contents through the small intestine into the cæcum.

For a few days afterward he was encouraged to eat ordinary food and was examined at frequent intervals. As nothing was found to confirm the diagnosis, he was sent home and asked to return at once if he had a recurrence of the attacks. Unfortunately, he was prejudiced against operation and though warned by increasing attacks, he did not return until March 15, 1918. At this time he had an active obstruction of small-intestine type, producing severe paroxysmal pains, visible, audible, and palpable peristalsis, inability to pass flatus, and frequent vomiting.

At operation on March 16, 1918, a hard nodule, obviously a malignant growth puckering and contracting the gut by extending round it and infiltrating the mesentery, was found two feet above the ileocolic junction. There was no sign of obstruction above the growth, but on following the pallid empty intestine upward about two feet higher a similar growth was encountered; this was clearly the cause of the obstruction. Above it the intestine was tense, much distended and reddened.

About two feet higher than the stricture a third nodule was found, which was almost occluding the portion of bowel it involved. The mesentery throughout was studded with enlarged glands. A large lateral anastomosis was made between the ileum above the highest stricture and the transverse colon.

After operation the intestinal symptoms disappeared at once. His condition, however, was not good. In the third week his general condition had improved, but recurring griping pains and renewed audible rumblings made it clear that his intestine had increased difficulty in emptying itself and it was feared that the bowel would soon burst below the anastomosis unless something further was done.

On April 2, 1918, the abdomen was reopened. The ileum was divided below the anastomosis, isolated from its mesentery down to the cæcum and the whole excised, both upper and lower ends being closed by sutures.

Recovery was uneventful and the patient was still well at the time the article was written.

It is Morison's belief that bursting of the excluded bowel is brought about by the formation, first, of round or oval gangrenous patches, and if these do not perforate, of gangrene of the whole of the involved loop. He cannot recall a single instance where gangrene of the hollow viscera was produced by bacterial infection. He believes that vascular defects are the essential primary cause and bacterial infection secondary.

The case which he describes is an illustration of another cause of gangrene of the hollow viscera, which, though not common, may be and has in his experience proved to be the cause of disastrous accidents. The carcinomatous growth in this case resembled a signet ring, with its seal in the mesenteric border, the ring encircling the gut. There were also enlarged glands in the mesentery. Either the thickened, seal-like induration in the mesentery could obstruct the circulation sufficiently to cause ring gangrene of the gut, or one of the enlarged glands could obstruct one of the larger branches sufficiently to produce an extensive gangrene.

It is his belief that operations for cancer and for tuberculosis are not sufficiently often performed; that while the operation may not produce a cure, yet it gives sufficient palliation to warrant its undertaking.

G. W. HOCHREIN.

**Lynch, J. M., and Draper, J. W.: Acute Intestinal Obstruction.** *Med. Rec.*, 1918, xciv, 274.

Twenty-four cases of acute intestinal obstruction occurring in 22 patients are reported, with a mortality of 25 per cent. The causes of obstruction were in 5 cases due to intussusception, with 1 death; in 5 cases to cancer, with 2 deaths; in 8 cases to postoperative bands or displacements, with 3 deaths; in 1 case to hydronephrosis, and in 3 to ileosphincteric translocation.

There were 3 recurrences in a luetic patient, the last one fatal.

All the patients operated upon within 48 hours lived; 90 per cent operated upon under 72 hours lived. Most deaths occurred in those lasting longer than 72 hours. Drugs are most undesirable in treatment. No case dies in so-called adynamic ileus where the stomach and colon are washed out.

Pain is directly proportionate to the strength and irregularity of the peristaltic waves. It is characterized by exacerbations and remissions.

I. E. BISHKOW.

**Reimann, S. P.: Primary Carcinoma of the Vermiform Appendix.** *Am. J. M. Sc.*, 1918, clvi, 190.

Cases of primary carcinoma of the vermiform appendix to the number of almost 300 have been reported. A few characteristics of this neoplasm have been revealed. It occurs more usually in the female, and more often in younger than older persons. It has never been diagnosed clinically and seldom grossly. Clinically it is usually benign, but malignant results have been reported, and it is found in from 0.33 to 1 per cent of appendices examined. It is almost always

associated with some form of inflammation, and occurs in two main histological varieties, a form with small cells and usually much fibrosis, and secondly, a cylindrical cell type resembling carcinomata of other parts of the intestinal tract.

Sixteen cases of primary carcinoma of the appendix are analyzed in this paper and each case may be seen to fall into one of the two classifications, viz., the small cell type and the columnar cell type. All of these cases present a rather composite picture, bringing forth the following findings:

In practically every case there was an ulcerative process bringing the case to operation. Generally the small cell type showed fibrosis with nests of epithelial cells in a connective tissue framework. Occasionally a small tumor mass was found and was liable to show in any part of the appendix. The mass might be found also in any one of the layers of the appendix infiltrating to any of the other layers. The nests were made up either of more or less degenerated cells, staining poorly in cytoplasm and nuclei, or well-staining cells with dense nuclei. In a number of cases there was lymphatic infiltration and some hyalinization. The main difference noted in the two types was in the histological form.

A summary brings out the following facts:

1. Sixty-five to seventy-five per cent occur in females.
2. The age is usually in the second and third decades, with the extremes at five years and eighty-one years respectively.
3. The great majority of cases show the condition is essentially benign although metastases and extension have been reported. The columnar cell type seems to be the more malignant, though data are inconclusive.
4. In no case was the diagnosis made clinically. In four cases the tumor was diagnosed grossly and in four cases it could not be recognized grossly, even when the histology was at hand.
5. Practically all the tumors were situated at the tip or in the distal third. A bulbous tip was exhibited by four.

I. W. BACH.

**Cotte, G.: Appendicostomy in the Treatment of Severe Acute Dysentery** (De l'appendicostomie dans le traitement des dysenteries aiguës graves). *J. de chir., Par.*, 1918, xiv, 463.

Cotte does not know whether others have tried surgery in the acute forms of dysentery. Having watched the evolution of a number of severe cases, it seemed to him that this essentially intestinal disease, localized to the large intestine, would benefit from an operative intervention which would give rest and lavage to the tract.

Up to the time of report he performed appendicostomy in 5 severe acute cases which medical treatment failed to relieve, and with very advantageous results. The cases were operated upon from the fifteenth to the twentieth day after onset. Four of these cases recovered. The fifth case, an ulcerated gangrenous dysentery, had a fatal termination.

Incision is made over McBurney's point. The appendix is resected, keeping a short stump to pass a sound. The cæcum is fixed to the parietal peritoneum by silk sutures; the wall is then closed with the exception of a passage for the sound. A general anæsthetic is used. For the lavage, nitrate of silver solutions 1:1,000 every one or two days while loose stools continue have been well tolerated. The cases in which appendicostomy was tried were not selected, but all were cases in which other therapeutic measures had been tried in vain.

W. A. BRENNAN.

**Rojas, D. A.: Rupture of the Colon by Abdominal Contusion** (Rupture del colon por contusion de abdomen). *Semana méd.*, Buenos Aires, 1918, xxv, 724.

The patient was struck in the abdomen by the pole of a cart. He walked to the hospital supporting the abdomen with his hands. On examination he showed extreme pallor; an expression of intense pain; hypotensive pulse; dyspnoea; the right hypocondrium showed that the musculo-aponeurotic plane was ruptured; but the skin was intact, although ecchymotic; there was intense pain on palpation in the region. The patient was evidently shocked. Injection, etc., failed to give relief, and five hours after entrance a laparotomy was done after a diagnosis of probable rupture of the colon with internal hæmorrhage.

All the tissues of the abdominal wall were found ruptured except the skin. Blood welled up abundantly through the incision. In the transverse colon, a few centimeters from its origin and on its anterior face, there was a contused area, somewhat oval in form and about 3 cm. in its greatest diameter, which was perpendicular to the intestinal lumen.

The colon was exteriorized from the rest of the peritoneal cavity and a small perforation was observed in the superior angle of the area. This was repaired by double invagination of the entire contused area. Further exploration of the colon showed a fissure of the serosa in the hepatic angle and a subserous hæmatoma which involved the anterior and external wall of the ascending colon. The fissure was sutured, the abdomen wiped out, the abdominal wall sutured and double drains placed. The drains were removed on the sixth day. The patient was up in less than a month, the wound being perfectly closed.

The author gives some bibliographical details concerning traumatic ruptures of the colon.

W. A. BRENNAN.

**Halsey, F. W.: A Study Based upon 1,400 Surgical Rectal Cases.** *N. Eng. M. Gaz.*, 1918, liii, 393.

Halsey reports a study based upon 1,400 surgical rectal cases. Many of these cases were suffering from some other pathological condition in addition to the rectal one. One of the gratifying points was the low mortality. Only two deaths occurred before the patients left his hands. Many of these cases were hæmorrhoids.



The author prefers excision or the clamp and cautery method in the treatment of his cases. As a general rule he waits until the patient is on the table, fully dilated, before deciding on the method to use.

The technique employed in the excision method is as follows: A stitch of No. 2 or 3 catgut is placed at the upper surface of the hæmorrhoid and tied. A double V is then cut through the mucous membrane, the apex of the lower V encroaching upon the skin, that of the upper V reaching to the safety stitch already placed, and the widest part of the double V being at the central portion of the hæmorrhoid. All diseased tissue is then dissected away down to the sphincter muscle; the mucous membrane is everted, and by a snipping movement of the scissors all hæmorrhoidal tissue, first on one side and then on the other, can be cleaned out thoroughly and completely. The mucous membrane is then brought together by a running stitch or interrupted sutures, if preferred.

In the author's experience the only complication occurring after this slit operation has been a small abscess forming on the line of sutures. Opening and draining has cleared this up in ten days.

In the treatment of fistula in ano he advocates a clean dissection of the ulcerated tract. To insure success, careful division of the sphincter is essential. After the fissure is thoroughly cleaned, the mucous membrane and other tissues may be brought together by catgut sutures, or the freshened wound may be left open to heal by granulation, being packed lightly each day.

In procidentia recti, where the prolapse results from laxity of tissue between sigmoid and anus, rectopexy has given the author better results than any other method.

Regarding cancer of the rectum he calls attention to the late date at which these cases appear for treatment. Unfortunately many times a thorough examination is not made and the patient is treated for hæmorrhoids, fissure, ulceration, or other rectal troubles until it is too late to secure any kind of a favorable result with operation. He advocates a colostomy in these late cases to give the patient relief from the pain which is constantly present.

G. W. HOCHREIN.

**Bruce, J. R.: Congenital Scrotal Anus.** *J. Missouri St. M. Ass.*, 1918, xv, 90.

Bruce reports a case of scrotal anus. The morning after birth the child began vomiting bile with some distention of the abdomen. On examination a scrotal fistula communicating with the rectum was found to exist which gave vent to a discharge of meconium.

The rectum was dilated with a catheter until a free escape of meconium occurred. This dilatation was continued until the swelling of the abdomen and the serum disappeared. Both scrotal and rectal openings are discharging fæces and the child seems to be doing well.

M. A. BERNSTEIN.

**Cahoon, J. H.: A Rational Procedure for the Extirpation of Hæmorrhoids.** *Med. Times*, 1918, xlv, 208.

To prevent the cicatrix which may follow after the clamp and cautery method, and the sapræmia and sloughing following the strangulation method, the author describes an operation which he says obviates these difficulties. This procedure however concerns only well-developed hæmorrhoids with hypertrophied tissue and large arterial blood supply, and not the small venous external tumors that can be slit and a blood-clot turned out.

Local anæsthesia is used, eucaïne being preferred. The hæmorrhoid is drawn down, after being well injected, and looped in a wire snare similar to that employed in a tonsillectomy. Sufficient pressure is exerted to prevent the noose from slipping. A needle threaded with chromicized catgut is used to anchor a purse-string suture about the base on the proximate side of the wire noose. The mass is then eliminated by the cold snare. Occasionally the tough mucocutaneous portion must be clipped with shears. The hæmorrhage is then controlled by ligating with the purse-string suture, just sufficient pressure being used to prevent bleeding. Healing is more rapid, comfort to the patient is greater, defecation not so painful, and blocking of the bowels by opiates or astringents is unnecessary.

I. W. BACH.

**Landsman, A. A.: The Requirements of a Successful Hæmorrhoidectomy and How They Are to Be Met.** *Med. & Surg.*, 1918, ii, 513.

The author believes that the ideal operation for a successful hæmorrhoidectomy comprehends details which may be summarized under the following heads: (a) proper preparation of the patient; (b) choice of a suitable anæsthetic; (c) selection of a method which is safe, suitable, and effective; (d) application of a technique which will permit the work to be done in the least time, with a minimum loss of blood and with as little danger from infection as possible; (e) after-treatment which is free from complications and painless, followed by a recovery which is speedy and complete.

He believes that the patient ought to have his bowels thoroughly cleansed by the administration of a physic the night before and by an enema two hours before operation.

He believes that, all things being equal, the operation may be done more quickly, with better surgical asepsis and less shock to the patient, under a suitable general anæsthetic. However, he does not deny local anæsthesia its proper place in rectal surgery. This, he believes, is especially indicated in the old and enfeebled anæmic persons in whom frequent hæmorrhage from ulcerated piles present urgent operative indications; in those who are subject to cardiac, renal, pulmonary, or arterial diseases; where there is a single tumor or a limited number which protrude well, and where the anal canal is roomy and the sphincters are well relaxed.

No matter what the operation, the method must

comply with certain definite conditions, such as the following: (a) the operation must be safe; (b) it must accomplish the purpose intended; (c) it must be reasonably free from dangerous complications and from pain; (d) it must do the work in the least possible time, both as to enabling the patient to get up from his bed and to return to his regular duties; (e) it must be free from a complicated technique.

Measuring by these standards, Landsman believes that the ligature method comes nearer to complying with this formula than do either of the others. He emphasizes the fact that work about the rectum must be done with the same scrupulous cleanliness and rigid asepsis which is practiced elsewhere. The sphincter should be well dilated as a preliminary in all rectal operations. No mouse-toothed forceps or sharp pointed clamps should be used. A groove is made to hold the ligature, to provide a pedicle, and to get rid of redundant skin. The ligature should be of strong linen thread. The tissue above the knot should be tied, taking care to leave a safe margin to prevent the ligature from slipping. A half-inch strip of gauze is inserted into the canal to keep the edges of the wound apart, a sterilized vaseline dressing is applied, and a tight T-bandage completes the operation.

In the after-treatment, in cases of inability to empty the bladder, the usual measures are tried. Sometimes it is necessary to remove the drain in the anal canal. A hot sitz-bath occasionally acts very well. The bowels are moved on the fourth day by means of a dose of castor oil. Healing of the wound is

hastened and granulations stimulated by the application once a day of 2 per cent silver nitrate, 50 per cent balsam of Peru or 10 per cent ichthyol on cotton swabs. If there is any excessive narrowing of the canal, prompt measures must be taken to overcome it by passing into the rectum Wales bougies of appropriate size twice a week. E. C. ROBITSHEK.

#### LIVER, PANCREAS, AND SPLEEN

**Helms, J. S.:** Treatment of Tropical Abscess of the Liver. *South. M. J.*, 1918, xi, 582.

The author emphasizes the following points in the treatment of tropical abscess of the liver:

1. It is an unnecessary and a bad practice to make exploratory punctures for diagnostic purposes, on account of the fact that the exploring needle will nearly always have to be passed through a part of the pleural cavity or through the peritoneum, and in this way these cavities are liable to be contaminated with infectious bacteria.

2. These abscesses should always be treated by the open method unless there is some contra-indication to operation.

3. The peritoneal or abdominal route is the safest and best avenue of approach and gives good opportunity for reaching and draining the abscess without danger of infecting the pleural cavity or the lung.

4. Local application of amoebicidal remedies through the operative wound is an important part of the treatment. E. B. FREILICH.

## SURGERY OF THE EXTREMITIES

### DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS, CONDITIONS COMMONLY FOUND IN THE EXTREMITIES

**Adair, F. L.:** The Ossification Centers of the Foetal Pelvis. *Am. J. Obst.*, N. Y., 1918, lxxviii, 175.

Adair's elaborate and detailed paper is a report of work performed in the laboratory of the Department of Obstetrics and Gynecology of the Institute of Anatomy of the University of Minnesota. This report is accompanied by numerous skiagraphic reproductions and by extensive tables giving in detail the centers of ossification as shown by transparent specimen, by X-ray, and by serial section. As a result the paper does not lend itself readily to an abstract. The author's own summary is given:

1. The first ossification center of the pelvis to appear is in the ilium about the 60th to the 65th day of foetal life in embryos with a c. r. length of from 30 to 35 mm. There are no separate secondary centers.

2. The median center of the first sacral vertebra is the next to appear, about the 74th to 76th day in embryos having a c. r. length of 51 to 52 mm.

3. The lateral sacral centers first appear when two or three median centers are present, in embryos 80 to 82 days old having a c. r. length of 65 mm.

4. The ischial center appears about the 94th to 98th day in embryos whose c. r. measurement is from 88 to 100 mm.

5. The pubic center is present on the 129th day in an embryo with a c. r. length of 150 mm. At this time all other centers which appear, until just prior or subsequent to birth, are usually apparent.

6. Practically all antenatal pelvic ossification centers are evident by the end of the 19th week of foetal life. CAREY CULBERTSON.

**Guarini, C.:** Osteoporosis in War Injuries and in Some Chronic Inflammations (L'osteoporosis nei traumatizzati di guerra ed in alcuni processi infiammatorii cronici). *Policlín.*, Roma, 1918, xxv, sez. med., 225.

Guarini says that the wide use of radiology is causing a renewal of interest in osteoporosis which is frequently observed by this means.

In war and other injuries osteoporosis is frequently found in the articulation immediately distal to the injury, for instance, in the bones of the hand with a forearm wound. But osteoporosis may occur with slight injuries such as dislocations, small subperiosteal fractures, etc. Delorme in 1,350 radiographs of bones found osteoporosis: (1) in half of the



cases of metacarpal injuries; (2) in one-fourth of the cases of ulnar injuries; (3) in half the cases of radial injuries; (4) in half of the cases of humerus injuries; (5) in the same proportion in injuries of the tibia and of the leg bones.

Guarini has made about 3,500 radiologic examinations of bone lesions and has found about the same proportion. Osteoporosis is especially frequent in injuries of the small bones of the hand and foot. According to his observations the osteoporotic process is due to inflammations which eventually occur in the vicinity of the articular cartilage, leading to the destruction of the cartilage, as well as to alterations in the periosteum. It is also favored by the long immobilization to which the part is subjected. The destruction of the epiphyseal cartilage interferes with the normal processes of nutrition. Immobilization is a factor owing to the compression from apparatus on the soft parts which interferes with the circulation.

The large number of war traumatismis which indicate a great increase in osteoporosis call for a more thorough knowledge and study of the condition than it has yet received. At present it is not known with certainty when the process commences in lesions of the bones and nerves.

The author recommends an experimental investigation of the whole process in fractures, under the conditions of nerve lesions, respiratory and gastro-intestinal changes, changes in the glands of internal secretion, etc. He plans to take up such a study later.

W. A. BRENNAN.

**Henderson, M. S.: Loose Bodies in the Elbow-Joint.** *J. Am. M. Ass.*, 1918, lxxi, 177.

The author believes that the general lack of knowledge concerning the presence of loose bodies in the elbow-joint can be accounted for by the fact that locking or impediment to motion in the elbow does not cause the same degree of inconvenience and suffering that a like condition would cause in the knee, and also by the infrequency with which this condition occurs as compared with the knee.

He divides them into two groups: (1) those definitely due to trauma, as in fracture; and (2) those not definitely due to trauma, the loose bodies occurring in numbers varying from one to twenty or more. He deals only with the latter condition in this article.

He gives a brief résumé of the literature dealing with this condition, and after a careful study of the subject has arrived at the following conclusions:

1. Loose bodies in the elbow-joint have not been of rare occurrence.

2. The etiology is doubtful. Trauma is a factor but not the sole factor. The synovia may be solely responsible, such a condition being called osteochondromatosis.

3. If left in the joint, the tendency is for the bodies to increase in number; therefore their removal is indicated, provided the patient's general condition is satisfactory.

H. J. VAN DEN BERG.

**Meyerding, H. W.: Diagnosis and Treatment of Tuberculous Arthritis of the Hip-Joint.** *Minnesota Med.*, 1918, i, 291.

Meyerding in his work in the Mayo Clinic has found that in 100 consecutive cases of tuberculous arthritis of the hip-joint, there were 23 patients in the first decade of life, 23 in the second, 24 in the third, 22 in the fourth, 4 in the fifth, and 4 in the sixth. The average duration of the disease before examination at the Clinic was 20 months, the shortest 2 weeks, and the most prolonged 46 years. He has, therefore, concluded that their practice consists principally of long-standing severe or neglected cases. The histories in these cases clearly showed that early diagnosis and proper treatment was instituted only to be discarded at the termination of acute symptoms, to be followed by recurrence, the formation of abscess, ankylosis, etc. Of these patients 56 per cent were males and 44 per cent females. The right hip was affected in 60 per cent.

He believes that the diagnosis should depend on a carefully written history, a clinical examination substantiated by the roentgenograph, and the laboratory findings. One should not depend on either the roentgenographic examination or laboratory findings alone. He lays particular stress on the history, bringing out the insidious onset, exposure to trauma, infection, etc.

Forty-four per cent of the patients at the Mayo Clinic gave a history of trauma directly preceding the primary complaint and in 17 per cent exposure to tuberculosis in the home was noted.

Among the earliest symptoms are muscle-spasm, limping, pain and atrophy, the patient frequently resting the well foot on the affected one, pushing down in the effort of traction and fixation. Pain is often referred to the knee-joint. Night cries may or may not be present and are not in themselves diagnostic, but associated with other symptoms aid in the conclusions. Later deformity, shortening, periarticular thickening, and cold abscess formation may become evident.

Roentgenographic findings are dependent on the stage of the disease, varying from synovitis, and thickened or distended capsule, to areas of rarefaction and general haziness or destruction of the entire joint and acetabulum, with upward displacement of the greater trochanter.

He calls attention to the value of Von Pirquet's test in children under five years of age. Its value decreases, however, with increasing age. Aspiration and guinea-pig inoculation proving the presence of tubercle bacilli is final evidence. Temperature, night sweats, other tuberculous lesions, etc., give further evidence of the disease.

He gives a very good table of differential diagnosis:

1. Traumatic arthritis or periarticular injury is differentiated by local tenderness, ecchymosis, the history, and a negative roentgenograph, while impaction fractures, later causing a limp, and shortening due to loosening up of the impaction, give positive roentgenographs.

2. Chronic hypertrophic arthritis appears in older persons and shows characteristic lipping arthritis without rarefaction. The limitation of motion is usually in abduction and rotation and there is little or no muscle-spasm, shortening, etc.

3. Infectious arthritis is usually multiple, acute, and accompanied by high fever and leucocytosis. A search for focal infection and its removal lead to rapid recovery. Aspiration and bacteriologic examination aid in differentiation.

4. Perthe's disease, osteochondritis deformans juvenilis, may be differentiated by the characteristic epiphyseal changes.

5. Infantile paralysis is easily differentiated in the paralytic stage. In the acute stage there may be local pain and tenderness for a short time which soon leave a typical paralysis.

6. Arthritis of the knee allows motion of the hip without pain when the knee is held immobilized and the entire limb carefully manipulated.

7. Pott's disease of the lumbar spine has as its earliest symptom muscle rigidity. Careful manipulations of the hip with negative roentgenographs will make clear that the hip itself is not involved.

8. Congenital dislocation lacks muscle-spasm, rigidity, atrophy, etc., and is positively diagnosed by the gait, palpation, and the roentgenograph.

As to treatment, Meyerding believes that sunshine, fresh air, and simple substantial food are the most useful general aids and preferable to dosing the patient with medicine. The local treatment is dependent on the stage of the disease and the circumstances. He prefers the Jones abduction frame, which allows fixation and extension, relieves pain and spasm, and at the same time corrects the deformity.

The patient should remain on the frame until all the acute symptoms have subsided, the general condition has improved, the deformity has been corrected, and roentgenographic examination shows redeposit of the salts. In adults the acute stage may be treated by Buck's extension, the limb being supported by sandbags. During the subacute stage, if no drainage exists, a cast of the Lorenz type may be used, together with crutches and the elevation of the sound limb by means of a patten. The length of time of treatment depends on the individual case.

At the time of examination in his series 90 per cent of the patients showed deformity, the flexion-adduction type being practically always present. Nineteen per cent were ankylosed and the average shortening was  $2\frac{1}{4}$  inches. The patients with deformities and those in the subacute stages were treated by brisement forcé with ether anæsthesia and plaster casts, followed by crutches. Osteotomy of Gant's type was performed in cases in which the deformity had become ankylosed.

G. W. HOCHREIN.

**Steinharter, E. C.: Infection of the Female Genital Tract; Its Relation to Arthritis.** *Ohio St. M. J.*, 1918, xiv, 468.

Two cases are presented, of joint symptoms due to a primary focus in the female genital tract.

The first is a woman fifty-two years of age, who showed tenderness, pain, stiffness and slight swelling of the joints for a period of two years. Various joints were involved, and the discomfort fluctuated in intensity but never entirely disappeared. Except for a procidentia, which was relieved by pessary treatment two months prior to the onset of the joint disturbance, the health had been good. After wearing the pessary there had been a thick yellowish vaginal discharge which gradually became very profuse. Physical examination revealed nothing except the joint and vaginal conditions. A hard rubber pessary presented just within the introitus. The tissues were atrophied around the pessary and removal was done under an anæsthetic. Speculum examination revealed an erosion about the size of a five cent piece and of considerable depth in the posterior fornix. This was bathed in pus and a culture yielded a growth of pure staphylococcus. Under local treatment the discharge ceased and the erosion healed. Coincident with this the joint symptoms diminished and in a short time disappeared without any recurrence.

The second case was a patient twenty-two years of age, married five years. There were two children, both normal births. For five months she had a profuse leucorrhœal discharge, but in all other respects was healthy. After missing two menstrual periods she aborted. Thirty-six hours later she felt feverish and developed thirst. Herpes appeared and the right wrist became red, tender, swollen, and painful. Cultures made of the uterine cavity yielded staphylococci and a small number of bacilli. Blood cultures gavestaphylococcus in pure growth. Under treatment the condition cleared up and the inflammation of the wrist subsided. Other joints meanwhile became involved, but in the course of time the arthritis disappeared and normal function returned. The left knee was aspirated but no growth was obtained.

Two rabbits were injected intravenously with the organism obtained from the blood culture in this last case. Both developed lameness and autopsies showed joint changes.

I. W. BACH.

**Rugh, J. T.: Foot Prophylaxis in the Soldier.** *Am. J. Orthop. Surg.*, 1918, xvi, 530.

The author describes the foot conditions that are found among soldiers, and the methods of treatment that are available in an army camp. He states that military and psychological problems often stand in the way of success of the work, and that the results are secured with difficulty. Four factors, he states, stand out in the solution of these problems, each of them capable of thwarting the efforts of previous success:

1. Feet. All types and all conditions are presented. The number of deformities, he believes, are about the same as those found among the allies.

2. Shoes. He believes that the Munson shoe can be fitted to 98 per cent of men and a great number of foot conditions can be prevented or cured by



these shoes. Suggestions are given as to the care of the shoes, and the socks as well.

3. Officers. He states that they are responsible for the care and fitting of shoes. The officer should be instructed in the care of feet, shoe fitting, alterations, exercises, and general hygiene.

4. Soldiers. They should wear properly fitting shoes, and give proper care to the shoes. Trouble with the feet may develop when some task becomes irksome or unpleasant, and he can simulate disability. The mental atmosphere of men in the draft age must be reckoned with in all cases of potential disability.

From an orthopedic standpoint, measures which have proven most potent in foot prophylaxis are four: (1) detection of potentially weak cases; (2) restoration of the balance of the foot by proper alteration of the shoe; (3) after-training in a proper way of walking and standing; (4) exercises for the restoration of muscle power.

The question of correction by operation he believes should be done in the reconstruction hospital and not in a base hospital in camp. Although all the operations are simple in civil life, in military service there are many obstacles to success, and the government must be protected against false and unjust claims after the war is ended.

He strongly advises that a thorough inspection of foot conditions of the new recruit should be made upon admission into the service. If the recruit is transferred, the proper correction should be made before he reaches his final destination. Intensive instruction should be done in each regiment; proper cobbling and alteration outfits should be procured from the quartermaster's department, and shoemakers and cobblers should be assigned to this duty, preferably for temporary duty. The regimental surgeon should take care of these cases under the instruction of the orthopedic surgeon. The orthopedic surgeon should learn his own problems and work strictly within the limits of his responsibility and duties.

C. C. CHATTERTON.

## FRACTURES AND DISLOCATIONS

**Morton, C. A.: Treatment of Fracture of the Shaft of the Humerus by Splints.** *Lancet*, Lond., 1918, cxcv, 77.

There is only one way in which fracture of the shaft of the humerus can be absolutely fixed, and that is against the chest wall.

If the combination of a posterior and an internal splint is used fitted together and fixed by plaster to the chest, a stable support is provided for the arm when the patient is sitting up or lying down. Anterior and outer splints can be added, if thought necessary, and fixed by webbing. The posterior and internal splints should be joined by small nails or thin strips of metal. The author prefers fixation of the elbow at 67°.

There is no objection to placing the limb in the abducted position if both fragments are equally

abducted. The splint cannot be used for fractures higher than one inch below the surgical neck of the humerus. If a fracture is at this high level, one must be content to fix the arm in an interoposterior splint with forearm projection, fixed by plaster against the chest wall.

The splint is best applied with the patient standing or sitting on a stool with body erect and shoulders level. The splint is well padded and the forearm placed in semi-pronation and left uncovered for massage and electrical treatment in lesions of the musculospiral nerve. The arm is fixed to the chest wall by plaster of Paris bandages which may be passed over the opposite shoulder for added security.

V. C. HUNT.

**Ghillini, C.: Treatment of Fractures of the Neck of the Femur** (La guarigione della frattura del collo femorale). *Policlino*, Roma, 1918, xxv, sez. prat., 725.

Ghillini says that union of fractures of the neck of the femur is always obtained with deformity. The reason is that no one has observed that when the patient is in the supine position during recovery, the distal fragment of the femoral diaphysis is always in a plane below the central fragment of the femur head in its cotyloid cavity. This low displacement of the inferior fragment has not been regarded as important; but it should be added to the three cardinal symptoms of fracture of the femoral neck. By giving attention to this the author has been able to obtain excellent results. Recovery has been so perfect that doubt was cast on some radiographs which the author showed at the Bologna Congress of Surgery in 1917. Some of these radiographs are reproduced and show the conditions before and after treatment in intracapsular and extracapsular fractures.

The method followed by Ghillini is as follows: The pelvis rests on a support. The limb is held by the foot and leg in order to exercise traction. In the healthy limb and in the injured limb the distance from the superior anterior iliac spine to the great trochanter is measured. An assistant then raises the great trochanter until the distance is the same on both limbs, and it is maintained in this position. A plaster cast is applied reaching from the umbilicus to the knee. The assistant who exercised the traction puts the limb in abduction and internal rotation. While the plaster is consolidating, the operator maintains the raised position of the great trochanter in such a manner that the lower fracture fragment is in perfect position. A Volkmann's traction apparatus maintains the foot in internal rotation. Immobilization continues for fifty days; then kinesitherapy is begun.

The author states that he has always obtained perfect correction of the fracture by this method and he believes that he is the first to obtain these perfect results in fractures of the neck of the femur. A later report on cases will be made.

W. A. BRENNAN.

**Turner, P.: Gunshot Fractures of the Femur; Some Methods of Reducing Serious Displacements.** *Lancet*, Lond., 1918, cxcv, 74.

Treatment of compound fractures of the femur on the Thomas splint has been so generally adopted and has so many advantages both as regards comfort of patients and easy performance of dressing with the least amount of pain and disturbance of fragments, that the following remarks apply only to patients treated in this way.

Serious displacements will come under one of the following heads:

1. Shortening. This is often due to obliquity of fracture or to overlapping of main fragments, which can be overcome by efficient extension. The author has used steel springs to obtain extension, the springs of ordinary spring mattresses answering very well. They are easily attached and have distinct advantages over other methods of extension.

2. Rotation. With a Thomas splint rotation may occur. This can be prevented by the use of lateral supports with tape to be attached to the bars of the splint.

3. Sagging can usually be prevented by proper adjustment of the supports of the splint.

4. Displacement of comparatively small fragments at the ends of the bone to which powerful muscles are attached may be difficult to rectify. The wire suspension and traction method is often effective. A loop of silver wire is manipulated over the free end of the displaced fragments and pulled into position, where it is maintained by attaching the wire to a rigid arch passing over the limb between the two bars of the splint. It may at times, in order to attach the wire to the fragment, be necessary to enlarge the wound or make a fresh incision. The presence of the wire causes no irritation or increase of sepsis, and there is no pain if the wire does not press against nerve-trunks.

The shortest time the wire has been left in place is two weeks; it is better to leave it three or four weeks. Though in some cases wire suspension can be carried out with advantage as soon as the patients are admitted, as a rule it should be left until the acute infection has been overcome and the swelling has subsided. The chief advantage of the method is its simplicity.

V. C. HUNT.

**Turner, P.: Method of Reducing Dislocations of the Shoulder-Joint.** *Practitioner*, Lond., 1918, ci, 75.

Recent dislocations of the shoulder-joint can as a rule be reduced by the Kocher method or by direct traction. In the presence of considerable muscular spasm or pain, general anæsthesia may be necessary. Occasionally in certain unusual cases these methods fail.

In twelve such cases, among which were several of long duration, the following method was successfully used by the author. A towel is looped around the inner side of the arm, just below the axillary folds, so that the free ends pass out at right angles

to the long axis of the body. The patient is anæsthetized, an assistant grasps the forearm on the injured side and applies extension strongly, parallel to the long axis of the patient's body. Simultaneously, the anæsthetist makes counter-extension with his fingers in the axilla, while the surgeon pulls the free end of the loop outwardly. There were no complications in any of these cases.

H. H. FREILICH.

**Mayer, L.: Congenital Anterior Subluxation of the Tibia.** *Am. J. Orthop. Surg.*, 1918, xvi, 521.

The author ably describes this deformity, its pathology, and suggests a measure of treatment. The article is profusely illustrated with drawings, photographs, and X-ray pictures. He does not call this condition "genu recurvatum", nor is it a true luxation in all cases. Investigation proves that it is only a partial dislocation or subluxation of the tibia on the femur, as study reveals that the extensors of the knee and the anterior portion of the capsule are shortened. The flexors may be dislocated forward, so as to be converted into extensors. The patella is usually displaced forward, and the anterior portion of the femoral condyles is usually flattened.

The treatment in some cases is simple, and in other cases it is difficult. Many cases cannot be reduced without an open operation. The operations are discussed, especially the lengthening of the patellar tendon. A case report is given.

C. C. CHATTERTON.

**Teece, L. G.: Some Points on the Treatment of Bone and Joint Wounds.** *Med. J. Australia*, 1918, ii, 91.

In treating fractures of the femur the Thomas splint is utilized except when the fracture is in the upper third of the thigh, in which event the Jones abduction frame is best. The saddle of this frame must be made of basil leather and stuffed with lamb's wool to obviate the formation of bedsores which assuredly will form if American cloth, ordinary leather, or other stuffing be employed.

In the application of Thomas' bed knee-splint, some of the important features are indicated:

1. The ring should fit accurately so that the counterpressure is obtained against the tuber ischii.

2. The posterior displacement of the lower fragment of the femur is the deformity most difficult to overcome and one which is present in almost every case. To correct this the posterior gutter splint should not be used, but rather strips of flannel bandage 10 cm. wide placed close to one another around the inner bar, doubled under the limb and brought back and fastened firmly to the outer bar by paper clips or safety pins.

3. The glue advocated by Sinclair is the best method of applying extension.

4. If the fracture is at or below the lower third, the Thomas splint should be bent so that the knee is flexed to 35°, thus relaxing the pull of the gastrocnemius.



5. The splint must be examined and the extension tightened and flannel bandages adjusted daily to gradually overcome any shortening or deformity if present. The femur has a natural bowing forward and genu recurvatum is obviated if proper adjustment of the flannel bandages is constant.

6. The foot must be maintained at right angles to the leg and can be done best by strips of gauze glued to the sole of the foot and tied to the top horizontal bar of the foot-piece which is sprung on the side bars of the splint.

If the Thomas splint is satisfactorily applied, the surgeon should be able to stand at the foot of the bed, raise the end of the splint in his hand, and wave it about freely from side to side and up and down without causing the patient the slightest discomfort. No other splint will answer this test.

In France the early treatment of knee-joint injuries followed four lines:

1. Excision of the wound, irrigation of the joint and filling with 2 per cent solution of formalin in glycerine. This treatment gave good results in some cases, but not where sepsis was marked.

2. Primary excision of the joint even in the presence of sepsis. This method is unreservedly condemned.

3. Wide laying open of the joint by turning the ligamentum patellæ and patella upward over the quadriceps and flexing the knee acutely, afterward straightening the limb and replacing the patella when sepsis had subsided.

4. Drainage of the joint by means of tubes passed through from side to side. These methods often lead to ankylosis.

In reviewing the records of 50 cases the conclusion was made that the prognosis as to movement depends mainly upon whether there is fracture through any part of the articular surface. In its absence the prognosis is good; in its presence it is bad.

In over 100 cases of ununited fracture, not one appeared in the femur or tibia, but all were in the humerus, ulna, and radius and were treated by very long and large bone grafts placed deeply into the healthy shaft.

P. W. SWEET.

#### SURGERY OF THE BONES JOINTS ETC.

**Bertein, P.: Eight Cases of Primary Reunion of the Knee** (Huit cas de réunion primitive du genou). *Bull. et mém. Soc. de chir. de Par.*, 1918, xliv, 1116.

In Bertein's 8 cases of primary suture, the time elapsed between injury and operation varied from twelve to sixty hours. All were shell injuries. Two were simple penetrating wounds with included projectile but without bone lesion. After arthrotomy and removal of the projectile, the joint was washed with warm salt solution and the wound completely sutured. Both recovered with complete mobility. There were 2 cases of patellar fracture and 4 cases of complicated condyle fractures primarily sutured after surgical cleansing and necessary resection. The 2 patellar cases made excellent recoveries. The condylar fracture cases all recovered, but with anky-

losis, and in one case it was necessary to reopen the wound on account of threatened infection.

Bertein is of the opinion that primary suture may be done when examination of the joint shows that it is sterile or that a commencing infection has not become diffused; moreover the surgical conditions must be suitable. Practically, a bacteriological examination cannot always be made, and Bertein bases his judgment after the arthrotomy on the condition of the synovial fluid and on the aspect of the soft parts. Bertein does not suture if the synovial fluid is murky or fetid or if the soft parts are largely gangrenous. Moreover early evacuation of the wounded should not be necessary.

W. A. BRENNAN.

**Combier, V., and Murard, J.: Study on the War Surgery of the Wrist; Operative Indications Given by Results** (Étude sur la chirurgie de guerre du poignet; indications opératoires d'après les résultats). *Rev. de chir.*, Par., 1918, liv, 1.

Direct war injuries of the wrist-joint are infrequent in war, and there is but little literature on the subject. The authors observed 27 cases, most of which they have been able to follow for a considerable time. They give the histories of these cases with some illustrations. From the results they draw conclusions as to the value of the various kinds of treatment adopted. The great object of surgery here is the preservation of function, as it is obvious that this is of far greater value in the upper than in the lower limb. The surgical means available are opening up and surgical clearance, partial resection, and total resection.

The authors divide wrist injuries into: (1) recent injuries, and (2) infected wounds.

In recent injuries of the joint without bone lesion the ideal treatment is suture of the synovial after ether lavage, but it cannot always be done. If there is a bone lesion, one or several bones may be involved. The authors deal with the resections necessary in the various types of cases which may be met.

With regard to the results to be expected from primary wrist resections in war injuries, especially of the carpals, the authors think that they are inferior to those for tuberculosis or for closed fractures. A new factor is interposed, depending on the injuries of the soft parts. These latter can cause great disturbances in the functional results. The end-results, however, are preferable to amputation or disarticulation. There is another factor also militating against good results after resection, and this is the difficulty of keeping such patients under sufficiently long supervision to see that re-education of function and physical therapy is faithfully carried out.

In wrist injuries termination with ankylosis seems to be the most frequent result. This ankylosis, however, is compatible with a good use of the hand in most cases. The end-results show that most of these operated patients can use their hands to perform all or nearly all necessary movements.

With regard to infected wounds, suppurative arthritis of the wrist in war wounds gives very poor

results, as it is easily understood that the lesions are not limited to the articulation, but that the infection spreads to the synovial sheaths, tendons, etc. In 4 such cases in the authors' series amputation of the forearm was necessary in one case and will probably be necessary in another. The other two cases have a very poor functional result. W. A. BRENNAN.

**Le Fort, R., and Cololian, P.: Pseudarthroses and Loss of Substance of the Ulnar Diaphysis** (Les pseudarthroses et pertes de substance de la diaphyse du cubitus). *Rev. d'orthop.*, Par., 1918, vi, 117.

The authors detail 15 cases of war lesions of the ulna with extensive loss of substance. Such injuries are frequent in war surgery, especially after mechanical clearance operations (esquillectomies). It is only exceptionally that they cause a deviation of the hand even when the lower ulnar epiphysis is drawn upward.

Losses of substance of the middle and especially of the inferior extremity of the ulnar diaphysis are not very damaging of themselves and do not call for direct surgical treatment. Disturbances of movement, when existing, are due rather to concomitant lesions of the ulnar nerve, muscles, tendons, etc. An active physiotherapy, massage, mechanotherapy, etc., is useful to obtain restoration of function, and in certain cases can be supplemented by nerve suture, liberation, etc.

Simple pseudarthroses of the ulnar are usually more injurious than large losses of substance. They may call for osteosynthesis, especially if a concomitant fistula requires operation; and in case of failure a resection of the fragments may be necessary.

An ulnar-radial implantation for extensive losses of substance of the superior part of the ulnar diaphysis not only restores the integrity of the forearm, but it does not, contrary to belief, obviate movements of pronation and supination.

In case of synostosis of the lower radio-ulnar articulation, the resection of a segment of the ulna with its periosteum above the zone of osseous fusion allows the return of movements of pronation and supination.

Losses of substance in the lower half of the radius can be treated advantageously by graft of a fragment of the neighboring ulna. The length of the removed fragment should correspond to half of that of the loss of substance. The inverse operation, an ulnar graft of a radial fragment, is contraindicated. W. A. BRENNAN.

**Leriche, R.: The Importance of Regeneration of the Neck of the Femur After Extensive Hip Resections; an Operative Method of Obtaining It Primarily** (De l'importance de la régénération du col femoral après les résections étendues de la hanche et sur un procédé opératoire permettant de l'obtenir à la période primitive). *Bull. et mém. Soc. de chir. de Par.*, 1918, xlv, 916.

When the results of hip resections involving the neck of femur are examined after some length of

time, it is observed that the neck and head never regenerate. The fact is not new and was observed by Ollier in animal experiments, as well as clinically. This absence of regeneration in the neck is undoubtedly the real cause of the mediocre functional results obtained in extensive hip resection. No real progress has been made in this line of work, and one justly is advised to attempt an ankylosis rather than a mobile joint.

In the customary methods of resection it appears to be the chief aim to open the capsule as early as possible, disinsert the muscles and expose the diaphysis to the saw.

The periosteotome works from inside outward. When the capsule is open the joint cavity is gaping and only the insertions external to the capsule are preserved. Leriche, however, instead of opening the capsule at once, removes the neck from without, commencing with its petrochanteric insertions and working as far as possible all around. The periosteotome being applied on the bone, the capsule is pushed back against the cotyloid cavity as if one wished to enucleate the cotyloid head without opening the capsule. The change in technique therefore in a word is separating the structures from the bone from outside inward rather than the older method of from within outward.

Leriche insists that what he does is nothing more than the strict execution of Ollier's technique of resection, viz., of leaving some bone tissue to protect the frail osteogenetic layer.

By this method Leriche obtained a remarkable regeneration of all the upper extremity of the femur in a soldier whose injuries called for an extensive subtrochanteric resection. A radiograph 182 days after operation showed the neck implanted almost at right angles on the diaphysis; it gave the impression of ossification along the capsule and guided by it. Functionally the result was quite as good; six months after injury the man walks three miles daily with the use of a cane; the hip is solidly in place; active movements of flexion of about 30° are effected in the joint, and passively some rotation is possible.

Leriche thinks this case shows:

1. The possibility of bone regeneration in the primary period.
2. The superiority of primary resection over late resection which Leriche has endeavored for the past three years to demonstrate.
3. The modification of technique which permits in the case of hip resections what is obtained in other articular resections, namely, reconstitution of the joint so as to permit functioning.

Leriche thinks that it is very easy to obtain a satisfactory regeneration of the neck in the most extensive resections, and even in the primary period in which it is held that periosteal osteogenesis is insufficient for the task. For this only a slight modification of the classical resection is necessary.

In the discussion by Tuffier, Quénu, Mauclair and others, Tuffier insisted on the Ollier technique



being considered as an intra-osseous rather than a subperiosteal resection; and Mauclair drew attention to the fact that, for several years experimental work had been done in America by Davis, MacEwen, Murphy and others, showing the necessity of preserving bone nuclei attached to the periosteum to secure regeneration.

W. A. BRENNAN.

**Peckham, F. E.: An Operation for Stabilizing the Foot and Ankle in Poliomyelitis; a Further Report.** *J. Am. M. Ass.*, 1918, lxxi, 438.

This paper is a further report of Peckham's work in the treatment of poliomyelitis. The operation which he advocates was first described in 1917, but the results have been so satisfactory and so permanent that he has deemed it advisable to again describe the technique.

The first case in which the operation was performed was a boy of seven with a right equinovarus and a left valgus deformity. The position of the feet was first corrected by tenotomies and held in such position for four weeks. On the right foot the fascia transplant operation consisted of first removing a piece of fascia lata from 2 to 2½ inches wide the whole length of the thigh. An incision was then made nearly the whole length of the leg. A second incision was made through the tough fascia which surrounds the tendons. These tendons were then dissected out and separated down to the annular ligament. In this case the tendons separated were the common extensor and peroneus longus.

The fascia covering the common extensor was split its whole length on the side nearest the crest of the tibia. The fascia lata was then stitched around the tendons at the lowest possible point, in such a manner as to form a cuff. The dissected surface was placed next to the tendons and muscle. After this cuff of fascia was securely fastened, the foot was held in an over-corrected position, while the upper end of the strip of fascia lata was firmly attached to the split tendon fascia at the upper end of the tibia or leg.

Then, at the lower end, again the strip of fascia lata was split to allow for a separate cuff to be arranged around the tendon of the peroneus longus, and the upper end was thoroughly attached in the same manner as described above. Then the sides or edges of the fascia transplant were stitched firmly to the edges of the split tendon fascia all the way up and down the leg, and incidentally to the muscle bellies as well. Through all this time the foot was held firmly in the over-corrected position. When this part of the operation was completed the skin incision was closed with silk-worm-gut.

He states that the anchorage in such an operation is so firm that the foot remains in the corrected position without any mechanical assistance. No plaster of Paris is applied. A strip of adhesive plaster is applied, however, beginning at the top on the inside of the leg, passing down under the anterior part of the foot and up on the outside of

the leg. The patient is kept in the hospital in bed for six weeks, then sent home and asked to report in two weeks. The author has applied braces for six or eight weeks while the patient is beginning to walk, but he is confident that these braces are not necessary.

He reports another case in which the paralyzed muscles were the tibialis anticus and posticus. Both cases were operated upon in 1917 and at the present time both children walk without any apparatus and practically do a heel and toe walk because with the foot held they strike on the heel. Then the remaining good muscle, whether it is the tibialis anticus or the common extensor, steadies the foot while the achilles tendon pulls up the heel.

G. W. HOCHREIN.

**Petit, H.: Contribution to the Study of Penetrating Knee Wounds** (Contribution à l'étude des plaies pénétrantes du genou). *Bull. et mém. Soc. de chir. de Par.*, 1918, xlv, 1116.

Petit's report advises against systematic arthrotomy with section of the patellar ligament. Cases treated by this method require immobilization of about three weeks, during which the quadriceps atrophies. Recovery is always imperfect as regards function. Of 14 cases of knee injuries operated upon and primarily sutured, the U-incision and section of the ligament has been done only in 3, in which radiography showed a large projectile deeply embedded between the condyles or in which the bone lesions called for immediate resection. But such cases are most infrequent, and the majority of knee injuries are best treated by vertical incision, which may be single or multiple according to the case and the radiographic findings, respecting the patellar ligament. Mobilization is then early and the patients preserve all movements. Such results were obtained in 10 of the 14 cases in which Petit followed this technique.

A lengthy discussion following this report resolved itself into an expression of opinion whether wounds of the knee-joints should be operated upon at the front if they had to be evacuated. Tuffier expressed the opinion of the society as favoring complete closure of articular wounds at the front, even if early evacuation should be required. They should be well immobilized for transport, evacuated to a safe distance, and examined on arrival.

W. A. BRENNAN.

**Yvert: A Case of Interilio-Abdominal Disarticulation** (Note sur un cas de désarticulation inter-ilio-abdominale). *Bull. et mém. Soc. de chir. de Par.*, 1918, xlv, 1070.

A young man of eighteen years entered the hospital showing a tumor formation in the region of the right great trochanter, which he had noticed for three months past was rapidly increasing. He had suffered neither traumatism nor accident. The hip tumor was found to be on the abdominal side of the great trochanter, extending inward to the neighborhood of the right sacro-iliac joint. Radiography showed the point of origin of the tumor to be the

iliac bone. It was hard, smooth, and without adhesions. In view of the certain fatal issue if the tumor were left unchecked, the author decided to operate despite the gravity of operation and the poor chances of recovery.

An interilio-abdominal disarticulation was done. Antero-external and posterosuperior strips were cut following the technique of Girard of Berne; the muscles disinserted; the external iliac vein and artery ligated, respecting the primary iliac and internal iliac; the tumor was isolated, the right lower limb being put in forced abduction in order to reach its internal part. The posterior sacro-iliac ligament ruptured while the disarticulation was proceeding.

Hæmorrhage was extremely slight. Anæsthesia ceased before the operation was completed. Half an hour later the patient died of syncope. Microscopic examination showed that the tumor was a fibrosarcoma. There was no evidence of metastasis.

The author cites 16 disarticulations of this type from the literature. In 10 cases death was immediate or rapid, in 2 there was temporary survival with recurrence in a few months; in 4 a recovery considered definite. The statistics showed that 3 out of 4 patients die.

The small hæmorrhage in the author's case was due to the fact that the Mombourg method of hæmostasis was employed.

Discussion of the paper, in addition to verifying the formidable and almost constantly fatal traumatism due to interilio-abdominal disarticulation, brought out the facts that this operation was less grave in coxalgic cases than when done for neoplasms; also that in order to obtain a better prognosis in cases calling for operation, recourse must be had either to a two-stage operation or to pelvic resections.

W. A. BRENNAN.

#### ORTHOPEDICS IN GENERAL

**Freiberg, A. H.:** *The Casualties of War and Industry and Their Relation to Orthopedic Surgery.* *J. Am. M. Ass.*, 1918, lxxi, 417.

The great service which orthopedic surgery has rendered in the world war has been realized because of the peculiar training possessed by orthopedic surgeons, which embraces not only mechanical skill and resourcefulness, but also a general mastery of the technique of operative surgery. The "orthopedist" of the past has developed into the "orthopedic surgeon" of the present because of the fact that his professional background has become steadily more scientific, his methods more direct and simple, and the principles of surgical pathology more sought after and followed than the prescribing of elaborate apparatus.

The orthopedic surgeon has demonstrated that a great percentage of wounded men can be returned to active military duty within a reasonable time, who under former conditions would have been relegated to civil life not only with industrial usefulness impaired but as an actual burden upon their government.

The possibility of prevention of deformity and the preservation of function does not differ materially in war surgery, except in numbers, from its application in industrial surgery. Neither is the establishment of curative workshops, equipment for physical therapy in its various forms, and the skilled personnel to operate them, peculiar to the needs of war time. This should long ago have been instituted and operated in the interest of the industrial cripple.

R. B. COFIELD.

**Lovett, R. W.:** *A System of Orthopedic Instruction.* *Am. J. Orthop. Surg.*, 1918, xvi, 483.

The problem is to teach as much orthopedic surgery as possible in four, six, or eight weeks, so that no incompetence on the part of the physician will result. As a rule most of the class knew very little orthopedic surgery and many had no clear conception of the anatomy, physiology, and pathology of joints. It is the aim to give instruction in fundamental anatomy and physiology, applying this to the pathological conditions. Instruction should be as largely clinical as possible, every stage of progress being illustrated on patients. More facts are brought out by quizzing the class than by stating facts. The scheme is as follows:

1. Disease of the neuro- and muscular mechanism. The passage of motor impulse from brain to muscle is minutely described, with resulting conditions from pathological disturbances at various levels of the nerve. Next the physiology of muscle is explained. With this data in hand various conditions such as anterior poliomyelitis are discussed. Cerebral lesions are exemplified by cerebral spastic paralysis, with resultant effect on the affected muscles. Peripheral nerve injury is well illustrated by obstetrical palsy.

2. Static deformities, such as foot strain, scoliosis, relaxed knees in children, etc.

3. Joints. Structure, anatomy, physiology and pathology, and diagnosis and treatment are considered.

4. Bones. The gross structure, repair and function of each constituent part of bone, as periosteum, medulla, etc., are considered. This then makes clear the process in osteomyelitis, syphilis, rickets, etc.

5. Apparatus. The principles and application of apparatus are next taken up. Congenital deformities are spoken of, together with the application of artificial limbs.

J. J. KURLANDER.

**Young, J. K.:** *Orthopedic Diagnosis.* *Med. & Surg.*, 1918, ii, 524.

The author believes that as a means to a more accurate diagnosis of orthopedic conditions, thorough clinical and laboratory examinations are of commanding importance. In a general way these should consist of two main parts:

1. There should be noted a careful history of the patient's antecedents, his own previous personal



history, his habits, and a complete account of his present illness. Thus it becomes necessary to inquire into the period of his earliest childhood, even starting with his birth, the feeding, the diseases he suffered in childhood, what maladies affected him between childhood and adolescence. Had the patient ever been troubled with a throat affection, or with any dental trouble? What operations has he undergone? Inquiry should be made into his usual dietary, his genito-urinary history, amount and character of his sleep, bathing, whether or not of a constipated habit, and the condition of the bladder. Is he addicted to the use of alcohol?

2. In regard to his present illness, the careful diagnostician will interrogate the patient as to the date of onset, part of the body affected, the influence of the weather, occupation, posture, etc. A careful examination of the patient's body should follow, especially those parts having a bearing on the deformity under review. If the alimentary tract is the subject of inquiry, special attention should be directed to the condition of the teeth, gums, tonsils, pharynx, nose, and the nasal sinuses; and lastly to the stomach and the intestines. Again, in softening and deformity of the bones of the lower extremity, as in osteitis deformans, a systematic examination should be made of the cardiovascular apparatus, for

not infrequently the diagnostician will be rewarded by discovering the existence of venous stasis of the affected part, dependent upon the mitral regurgitation.

In studying the spine, note should be made of the existence of curvature, the presence of normal movements, muscular rigidity, swelling or tenderness. If a joint be involved, the other joints should be investigated as a comparative study, so as to observe their proper motion, the presence of muscular rigidity, tenderness, swelling, crepitation, and the presence of foreign bodies. In examining the feet, both the long and the transverse arches should be examined, and the existence of callosities sought for. The position of the toes should next claim attention and the presence of deformity noted.

An exhaustive study of the nervous system is always required. This includes particular attention to the reflexes and a careful examination of the motor, sensory, and the sympathetic pathways.

Orthopedic diagnosis is never complete unless the required laboratory methods be invoked when necessary in particular cases. From these cursory remarks will be seen the detailed study and the care which must be exercised by any one hoping to arrive at correct conclusions in orthopedic work.

E. C. ROBITSHEK.

## SURGERY OF THE SPINAL COLUMN AND CORD

**Albert, F.: Lumbar Puncture in War Surgery; Its Applications in Craniocerebral Surgery** (Le ponction lombaire en chirurgie de guerre; ses applications à la chirurgie cranio-cérébrale). *Lyon chirurg.*, 1918, xv, 328.

The author takes up the consideration of lumbar puncture in war surgery from two points of view, the diagnostic and the therapeutic. The applications of lumbar puncture in the various types of craniocerebral lesions are illustrated by the detailed findings in 15 selected illustrative cases. The conclusions drawn from these findings by the author are:

1. The findings from lumbar puncture are of such great value from the diagnostic and therapeutic viewpoints that the method merits a high place in craniocerebral surgery.

2. In all doubtful cases of cranial fracture or intrameningeal hemorrhage, puncture showing the nature of the spinal fluid will immediately fix the diagnosis.

3. Lumbar puncture alone is capable of determining with certainty the differential diagnosis between simple hypertension and irritation or local compression of a latent zone of the cerebral cortex.

4. Lumbar puncture is an unfailing means of distinguishing simple cerebral hernia from the hernia symptomatic of brain abscess or encephalitis. When the hernia is not reduced by repeated lumbar punctures, the existence of encephalic infection may be concluded with certainty.

5. All cases of commotion and of cerebral hypertension are always accompanied by hypersecretion of the spinal fluid which gives rise to hypertensive phenomena, resulting in the ordinary symptoms of cerebral compression. Lumbar puncture is the treatment indicated, as it at once suppresses the cause and effect.

6. Lumbar puncture is the only actual effective treatment of fracture of the base of the skull.

7. Cases of irritation of the cortex and of jacksonian epilepsy for which no apparent cause can be found are favorably influenced by lumbar puncture. Without directly acting on the local cause, by suppressing hypertension it can render the local cause ineffective. When a puncture has no effect in such cases, the existence of a very serious source of irritation is indicated and an exploratory craniectomy is called for.

8. Simple cerebral hernia always disappears completely under a series of lumbar punctures, on condition that they are made very early before adhesions or inflammatory granulation tissue have formed. When the hernia is reduced, it is rational in order to avoid recurrence to attempt secondary suture and an immediate cranioplasty if possible.

9. Abundant and repeated lumbar puncture is the treatment of choice and of real efficacy in post-traumatic meningitis whether staphylococcic or streptococcic. Intraspinal serotherapy can be combined with it advantageously. W. A. BRENNAN.

**Ortali, O.: Wounds of the Vertebral Column and of the Spinal Cord** (Ferite della colonna vertebrale e del midollo spinale). *Gazz. d. osp. e d. clin.*, Milano, 1918, xxxix, 465.

The most interesting class of spinal injuries is that in which there are lesions of the cord. Such are due either to direct passage of a projectile through the canal, or indirectly either to a bone particle projected by the force of the projectile into the interior of the canal or to the impact of the projectile against the canal wall without fracturing it.

The author dwells on the symptoms and their interpretation. He gives the symptoms for injuries in various sections of the cord. There is no special distinguishing symptom by which a complete section of the cord can be distinguished clinically from an incomplete section. Sometimes compression may be diagnosed, especially when paralysis is of gradual onset.

As regards operation, the author has seen several cases of complete section operated upon. They were all failures. He thinks that generally in such cases operation is not only useless but dangerous because it aggravates the patient's condition. There are, however, some cases in which operation is indicated and in which abstention would be dangerous. These are: (1) when a projectile is retained in the spinal cavity, even when the symptomatology speaks for total section, because it cannot be judged from the symptoms how much is due to the pressure of the projectile and how much to nerve destruction; (2) when there is fracture of a posterior arch of a vertebra and the fragments are embedded and may be compressing the cord; (3) when there is no complete abolition of the sensory and motor functions. Such cases are probably the result of compression with a partial cord lesion.

Operation is limited to opening the canal, removal of foreign bodies, examining the cord, and suturing the latter when sectioned. The results of operation vary according to the lesions. There is usually rapid

improvement in cases of compression. Some illustrative cases are detailed, to show the good results of intervention, especially in compression cases.

W. A. BRENNAN.

**Sharpe, N.: Cord Injuries in Spinal Fractures.** *Am. J. Surg.*, 1918, xxxii, 189.

In every case of fracture of the spine with damage to the cord, excepting only complete obliteration of the bony canal with a hopelessly crushed cord, an early laminectomy is urgently indicated to relieve the cord of the damaging effects of bone-pressure, hæmorrhage, and œdema, and to give the nerve tissue the best possible chance for repair.

Fractures with cord injury may be divided into two classes: first, fractures with symptoms of partial abolition of function; and second, fractures with symptoms of immediate complete abolition of function. The fate of the damaged and of many of the sound fibers depends on whether the factors producing the injury are temporary or permanent. If this compression by bone, blood, and the certain œdema which appears after every injury to the cord is quickly removed, not only will the sound fibers be preserved but functional and even anatomical repair will take place in many of the damaged but not destroyed fibers. A free opening for the dura is most important and should always be done.

The operation should be performed as soon as the patient has reacted from the shock, and the site of the lesion is localized. In cases with paralysis of the bladder, catheterization should never be attempted. If it is done, the resulting cystitis will carry off 50 per cent of the cases. Massage of the neck of the bladder or hot rectal injections will usually be found efficacious. The author believes that suture of a severed cord should be attempted, and is warranted by the great improvement in the sensory and trophic disturbances.

E. A. PRINTY.

## SURGERY OF THE NERVOUS SYSTEM

**Kawamura, K., and Kimura, T.: Experience with Foerster's Operation for Gastric Crises and Spastic Paralysis.** *Surg., Gynec. & Obst.*, 1918, xxvii, 129.

By Foerster's operation the authors mean the intradural resection of the posterior spinal nerve-roots.

A case of gastric crises in a male laborer, aged thirty-nine years, is reported in detail. One year following the operation the patient was in good health, without return of gastric pains or vomiting.

A case of Little's disease in a peasant boy, aged six, is also given in full detail. At the time of his discharge following his operation, it was possible for him to stand erect and to take a few steps with the aid of crutches.

The authors summarize briefly the chief points in their technique and results of the operation which they think deserve special mention.

E. C. ROBITSHEK.

**Noon, C.: Observations on 250 Cases of Gunshot Wounds of the Peripheral Nerves.** *J. Roy. Army M. Corps*, 1918, xxxi, 39.

Tables have been drawn up showing the number of cases operated upon. The various nerve lesions have been classified in a tabular form, and an attempt made to show the results obtained up to the present time. From a study of 250 cases, the following are the conclusions arrived at:

1. The diagnosis of an injury to a peripheral nerve ought to be made at the earliest possible time.



2. Successful recovery depends upon early, correct, and continuous treatment.

3. Primary suture should be considered and practiced whenever possible.

4. There should be no unnecessary delay in exploring a nerve if there is sufficient evidence that it has received some injury resulting in a macroscopic pathological lesion.

5. It is almost certain that some macroscopical lesion is present in cases which show no signs of recovery after four months' treatment.

6. Operations on injured nerves should only be done in well-equipped general hospitals, and by those surgeons who have ample experience in such cases.

7. Sufficient attention is not usually paid to the early pre-operative and postoperative treatment in paralytic deformities, and shortened muscles are often the result of ignorance and neglect.

8. The extreme gravity of an injury to a peripheral nerve is not sufficiently realized by the general profession.

EDWARD L. CORNELL.

**Nageotte, J.: Experimental Study of the Inconveniences of Direct Nerve Suture and a Method of Indirect Suture Which Avoids Them** (*Étude expérimentale sur les inconvénients de la suture nerveuse directe et sur un procédé de suture indirecte permettant de les éviter*). *Bull. et mém. Soc. de chir. de Par.*, 1918, xlv, 1031.

When the loss of substance in a nerve section is not too extensive to permit coapting the ends, direct suture appears to be the most logical method of repair. Long researches on the regeneration of nerves have led the author to think that it is too early to form a definite opinion on this matter.

Nageotte explains that if the process of repair is studied in an isolated nerve tract, reunion is never by first intention. On the superior stump a neuroma forms and on the inferior stump a glioma. This latter springs from the growth of the Schwann sheaths which persist after wallerian degeneration. The author has found that this neoplastic activity is not prevented by direct suture of the nerve ends after section. In such cases a tumor is formed within a fibrous sac, this tumor representing at the same time the neuroma, the glioma, and the intermediary cicatricial tissue between the two stumps.

Studying the problem of avoiding this phase of physiologic evolution, the author arrived at the conclusion that the best method would be the employment of grafts of dead nerves preserved in alcohol. In 2 dogs the sciatic nerve was sectioned; in one of these the ends were directly sutured; in the other a nerve graft taken from a calf foetus was interposed. These two dogs had the whole sciatic nerve sectioned. In four others the same procedure was carried out, but the internal popliteal sciatic alone was sectioned.

In the 6 experiments there were severe trophic disturbances, in 3 confined to those cases in which there was direct suture. Another dog had the two

sciatic nerves totally sectioned, one being directly sutured and the other with interposition of a graft of dead nerve. There was a satisfactory recovery in the two nerves, but the grafted case resulted in better recovery.

The author states that these results show that direct nerve suture exposes a limb to severe muscular and cutaneous trophic disturbance and that the interposition of a graft of dead nerve is less dangerous in this respect.

In applying the results to human cases, the author states that it is not necessary to use grafts of human nerves, and that the use of heterogenous grafts does not cause any trouble.

The calf nerve grafts used by the author were about 50 to 60 cm. long, fixed in alcohol, and kept in sealed tubes. They were held in place by a few silk sutures.

W. A. BRENNAN.

**Corner, E. M.: The Surgery of Painful Amputation Stumps.** *Proc. Roy. Soc. Med.*, 1918, xi, 7.

There have been such a large number of painful amputation stumps during the present war that a careful study as to the cause is necessary. The occurrence of painful nerves in amputation stumps was not unknown before the war. Instances of painful scars and nerve-endings were known but they were uncommon.

The object of the Queen Mary's Auxiliary Hospital at Roehampton was the fitting of artificial limbs to amputation stumps. It was soon seen that surgeons' ideas differed as to what was necessary or desirable in such a stump, and a work has grown up in which stumps which had been sent to Roehampton as suitable and found to be unsuitable were refashioned and made so that limbs could be fitted to them. The end of a nerve in healing has to go through three stages, any of which may be minimized, but none can be totally abolished. These stages are: (1) the stage of repair and inflammation; (2) the stage of compression; (3) the stage of regeneration.

Compression was regarded as the main cause of pain before the advent of the great era of infection. It acts in hundreds of ways and is mainly brought about by the contraction of the fibrous tissue on to the expanding growing tissue of the cut nerve-end. The contracting cap of fibrous tissue over the nerve-end is derived from the endoneurium, perineurium and epineurium, coats of the nerve. Through the meshes in them the unprotected regenerated fibers have to pass. This is the main place at which the strangulation of the nerves takes place. If any of the nerve sheaths can be uninjured in the division of the nerve, so much less the strangulation of the new fibers to be formed by regeneration.

There is always active inflammation in the proximal end of a divided nerve as shown by the round-celled infiltration between the nerve bundles. In order to produce a painless stump the stage of inflammation and the contraction of the scar tissue should be over before the nerve fibers push their

way out of the nerve-bulb and through the meshes of the tissue of the "internal" scar. Normally, more or less of this takes place, but in war cases regeneration begins very early after nerve injury and its processes proceed rapidly, this perhaps being due to the increased vascularity brought about by the inflammation and the irritation of the sepsis. Thus the nerve fibers begin to regenerate in a few days, according to Italian authorities, and they branch and branch again, one original fiber becoming represented by many fibers, each of which is a potential source of trouble; it may encounter an inflammatory nodule or become compressed. Thus possibilities of future trouble are manifold; the early regeneration enables the young fibers to become long enough to be strangulated before the scar tissue has ceased to contract, and the greater number of branches of new fibers make the occurrence of trouble still more probable.

Clinically there may be distinguished at least five types of pain in amputation stumps, the first of which is universal and the last uncommon.

1. Early pain, coming on immediately after the amputation, dependent on an endoneuritis set up by the injuries inflicted on the nerves at that operation. When alone present, this accession of pain dies away in a few days or weeks.

2. Compression pain, coming on about two months after the interval and sometimes steadily increasing. When bearable, this pain may pass off as the nerve fiber dies or the scar tissue ceases to contract.

3. Inflammatory pain. The early pain never passes off, or it may become paroxysmal and severe.

Clinically these cases may be grouped in a series; pain immediately after the operation is due to the trauma of that operation and the inflammation of the repairing tissues; a little later, after from two to ten months, the pain is due to the compression of the nerve fibers by the contraction of scar tissue; later still, pain is due to active inflammatory changes in the nerve-ends.

These three clinical types are distinctive, both clinically and pathologically. This is not so in the fourth type; nerve regeneration gives rise to no special clinical symptoms, and consequently the fourth type has no peculiar features.

The fourth clinical type is produced by the regeneration of nerve fibers. It is characterized clinically by more continuous pain and illusions as to the presence of the missing part, for instance the amputated foot. The pain is acute, and first appears within a few days of the amputation. At first it is not great, but increases in severity. At the beginning the new axis-cylinder has no myelin sheath to protect it, and it is easily rendered painful. As the inflammation in the wound subsides, the pain becomes less, until the fibrous tissue of the internal scar begins to contract and to squeeze the new nerve fibers. Now the pain may be very severe and may last some months. The pain is eased considerably by heat, and in some cases by

X-rays. The fourth type has clinical features of both the second and the third type.

The fifth type is only recognized clinically by the process of elimination; nerve-trunk after nerve-trunk is removed by operation and their consideration eliminated by trustworthy surgery. Still the pain and tenderness persist, and are not of neurotic origin. The skiagram may show that it is due to disease in the bone; terminal rarefaction of the bone is due to the injuries of operation and the healing of the wound; but when the bony changes are further afield they are partly due to nervous irritation, dystrophy. Such cases exhibit the usual signs of bone pain, night pain and pain in wet weather, and are very persistent.

It would appear that there are many causes for non-nerve-trunk pain in amputation stumps, and these may be classified according to their source of origin: bone, muscle, joint pains, etc.

Neglect to identify and cut the internal saphenous nerve may often be the cause of a painful stump.

One of the most successful amputations of the whole war is a supramalleolar amputation of the foot, a Syme's amputation. With it the patient can walk as well as he ever did and follow his ordinary avocation. Unfortunately the Syme stumps are sometimes tender. The explanation of the painful stump is almost always the same: the posterior tibial nerve is strangulated by the large internal scar. The anterior tibial nerve has either been retracted or cut short. The posterior tibial nerve is not so easily found and is rarely cut short. Some of these posterior tibial nerves become strangulated; the majority escape.

The sciatic nerve is undoubtedly responsible for the majority of painful nerve troubles after amputation of the thigh. It very easily becomes adherent to the hamstring muscles, particularly the semimembranosus; in consequence it is subjected to pulls with each movement of the stump. It forms a well-developed bulb, which is easily felt and demonstrated. A skiagram should always be taken, and if it reveals the presence of any bony growths from the posterior and inner side of the femur, Hunter's canal should be explored.

A very large percentage of patients, a far larger proportion than in any other type of amputation, arm or leg, who have undergone an amputation of the arm, suffer from painful and easily palpable nerve-bulbs on the inner side of the arm. It is not very apparent why this should be so. The nerves affected are principally three: the median crossing the artery, the ulnar between the artery and the basilic vein, and the internal cutaneous internal to the vein. These, with the musculocutaneous and the lesser internal cutaneous, may be caught with the vessels in the clutches of one single big scar stretching from the end of the amputation stump. The musculospiral nerve is so far away that it usually escapes being so caught. Consequently for their removal the nerves must be sought for, identified, and removed.



Bony formations here are unusual, while they are a plentiful and a distinctive feature on the posterior and inner part of the thigh. Forearm stumps, bearing very little pressure, are very unusually painful. In the neighborhood of the wrist the median and ulnar nerves would seem to be seldom nipped or inflamed, but they regenerate into infective fibrous tissue and into adherent tendons, the regeneration here as elsewhere being a new formation, and invading structures like malignant disease. The pull of the tendons or the inflammation and cicatrization of the scar tissue sometimes makes their excision necessary.

With regard to treatment:

1. Tender nerve-bulbs should be excised, together with a long piece of nerve so as to get above any perineuritis or ascending neuritis there.

2. The best method of removing a nerve is by means of the epineural sleeve advocated by Chapple and described in the *British Medical Journal*, August 25, 1917, page 242. A circular incision is made about one inch distal to where the nerve is to be amputated; a cuff of epineural tissue is turned back by means of gauze (doubtless some peripheral nerve fibers are also carried in the cuff); the nerve-trunk is divided close to the cuff, which is then drawn forward and its end ligated with catgut. Regeneration is not prevented, but the nerve appears later as a pencil, not as a bulb. The difference in shape is due to less formation of scar tissue, and the advantage is that there is less chance of nerve strangulation by the scar tissue.

3. Drainage should always be employed. A good-sized tube is used. Its non-use leads to hæmorrhage.

4. All ligatures and buried sutures should be of absorbable material to minimize sources of irritation.

The recommendations that the author makes to those surgeons doing amputations are the following:

1. Let the technique be as surgically clean as possible. Much harm results from "lighting a fire" in a wound.

2. Use only absorbable sutures.

3. Cut all nerves as short as possible, using the "swing-door" method to close their mouths.

4. Cut all vessels short, as they form the greatest channel for the spread of infection. By cutting them short, "the door is closed."

5. Drain temporarily all amputation wounds, using a large tube.

6. Start the Carrel-Dakin treatment at the time of operation in dirty cases.

7. In clean cases close the deep wound with a few catgut stitches.

What are the results of attempts to make poor nerve stumps good? The results are not good. They must be improved; otherwise re-amputation gives small hope of improvement.

Time must be allowed to elapse for stumps to heal and become painless. The stump meanwhile must be used and moved; its muscles made into useful structures; its blood and lymphatic circulations stimulated by heat, massage and movements, and improved by means of electricity and by the early use of a cheap form of artificial leg.

D. N. EISENDRATH.

## MISCELLANEOUS

### CLINICAL ENTITIES—TUMORS, ULCERS, ABSCESSSES, ETC.

Sittenfield, M. J.: **Further Studies on the Importance of the Lymphocyte in Cancer Immunity.** *J. Med. Research*, 1918, xxxviii, 465.

In a previous communication were reported experiments which failed to induce immunity in rats inoculated with Flexner Jobling rat carcinoma, when artificial hyperlymphocytosis was produced on the one hand, or to alter their resistance to it by depletion of the lymphoid cells in the circulating blood, on the other hand. To review the experiments briefly: In one set of white rats a high lymphoid count in the blood was induced by repeated injections of pilocarpine causing a general rise of the small mononuclear lymphocyte from 25 and 30 per cent to 55 and even 60 per cent. At this period they were inoculated with Flexner Jobling rat carcinoma and the resultant percentage of takes was the same in the controls as in the experimental rats.

In the second set of experiments a leucocytic cream from rats which had previously been treated with small or stimulating doses of X-ray was injected intravenously into normal rats so that a high lymphocyte count in the general circulation resulted, and

when these were inoculated with the Flexner Jobling rat carcinoma they maintained their normal susceptibility, as the percentage of successes did not differ from that in the controls, i.e., the artificial stimulation of the small mononuclear lymphocyte in both sets of experiments exhibited no manifestations of immunity.

In a third set of experiments a number of nullers whose absolute immunity was tested by several inoculations with the Flexner Jobling rat carcinoma were rayed repeatedly, almost depleting them of their lymphoid elements by causing the lymphocyte in the blood to fall to four per cent. When these were subsequently inoculated with the Flexner Jobling rat carcinoma their state of immunity was not in the least altered. In other words, the susceptibility to Flexner Jobling rat carcinoma in the one set of rats remained the same in spite of the hyperlymphocytosis induced, and in the other the state of resistance to it was maintained in the face of almost complete depletion of the lymphoid elements in the rats.

These results were so contrary to those reported by Murphy and Morton that further experiments were advisable in order to clear up the differences,

inasmuch as an important factor in immunity to cancer was concerned. Therefore several other experiments were conducted, following closely the work of Murphy, except that Flexner Jobling rat carcinoma was used in this work. In eighty-nine rats inoculated the tumor was excised completely, ranging at different periods from ten to twenty-eight days. While the tumor was out, a small or stimulating dose of X-ray was administered. They were re-inoculated with their own tumor in the opposite axilla. Careful blood counts were made before and after the raying to determine the degree of lymphocytosis, and in all but two the tumor grew at the site of the second inoculation. In none was there a recurrence at the original site of the tumor.

These results seemed conclusive that the degree of lymphocytosis had very little to do with immunity to Flexner Jobling rat carcinoma, and to test it further, it seemed advisable to repeat Murphy's experiment in mice. The results obtained in mice were quite similar to those reported by Murphy and Morton, excepting perhaps that the tumors recurred at the usual periods, and the latency of four or five weeks after the raying could not be confirmed. Careful blood counts were made in these mice before and after raying; the increase of the small mononuclear lymphocyte ranged in average from 30 to nearly 50 and 55 per cent in a total of 14,000 to 18,000 whites. The red blood cells also were quite high, ranging from 5,000,000 to 7,000,000. This high lymphoid generally reached its optimum in from forty-eight to seventy-two hours and continued for about five to six days. The tumor generally was of moderate size on the tenth to twelfth day.

Out of 93 mice treated with a small dose of X-ray, while the tumor was out of the body, and then re-inoculated with their own tumor, 54 tumors recurred, 18 died during the experiment, and the other 21 remained free.

GEORGE E. BEILBY.

**Colvin, A. R.: Lower Back Pain.** *Am. J. Orthop. Surg.*, 1918, xvi, 384.

The causes of lower back pain are quite numerous and a careful examination is usually necessary to determine the exciting factor or factors. The pains and aches of acute febrile disturbances, especially of small-pox, seem to center in the lower back of some individuals. Functional or static conditions explain a large number of backaches, especially in women. Here usually ligamentous pull or strain replaces muscular support due to a general or local muscular weakness. Visceroptosis produces a backache in this way, but is usually only part of a general condition. The author thinks that gynecological conditions as causes of backache have been over-valued, although pelvic inflammations do undoubtedly cause some backache, and nearly all lower back pain is aggravated by inflammatory pelvic conditions and the menstrual state. Genito-urinary and rectal conditions are very important and interesting as a cause of backache, such as renal stone, and hydronephrosis. The pain may be

entirely referred pain due to conditions situated somewhat remotely and in areas supplied by the ilio-inguinal, ilio-hypogastric, genitocrural, anterior crural, and sciatic nerves.

Disease and injury of the locomotor apparatus, i. e., bones, joints, tendons, muscles, and associated bursæ are a very common cause of lower back pain. Tuberculosis has in the past covered a multitude of joint conditions, but numerous other infections are responsible for a great number of conditions diagnosed as tuberculosis. Infectious arthritis plays an important rôle in the causation of lower back pain, as do also infections of bone, periosteum, tendons, muscles, and bursæ. The proneness of the sacro-iliac joint to distortion and displacement seems to be due to its markedly limited mobility and its static situation between the trunk and extremities. Tillman recognized the fact that diastasis of the sacro-iliac articulation is more frequent than formerly thought, and that one-sided distortion is often overlooked. The frequency of anomalies in the lumbosacral and sacro-iliac regions may be accounted for by the fact that these structures have undergone transition. Gross injury of the spinal column is usually very evident. True dislocation of the sacro-iliac joint is perhaps impossible without fracture of some part of the pelvic girdle. Distortion or sprain is quite common.

Due to the fact that the causes of lower back pain are so numerous and associated referred pains are so common, a careful clinical investigation should be made before any operative work is undertaken.

E. C. ROOS.

**Delaunay, H.: The Mechanism of the Circulatory Disturbances in Shock** (Du mécanisme des troubles circulatoires dans le choc). *Lyon chirurg.*, 1918, xv, 293.

Delaunay, starting from the proposition that arterial hypotension is the clearest and most constant feature in the condition of shock, endeavors to find the causes establishing hypotension, especially the mechanism of the circulatory disturbances.

Low blood-pressure is shown: (1) by the pulse; the difference in strength between the humeral and radial pulse; (2) by the oscillometric graph which is of paramount importance, as it permits a rapid prognosis indicating the value of treatment and chances of an operation; (3) by defects in the venous circulation with abdominal stagnation and peripheral emptiness.

The general circulation in a state of shock is thus so reduced that the tissues are pale and anæmic, the extremities cold, etc. Hæmorrhage is the best known cause of hypotension, although its diagnosis is not always easy. Its results are the same as those of abdominal venous stasis, viz., deficiency of blood in the large intrathoracic vessels and lungs; immediate lowering of the arterial pressure; and finally anæmic intoxication.

In some cases the heart may fail to adapt its function to the sudden rise of pressure which follows



an injury; low pressure is then the defensive reaction of the organism. This hypotension provoked by vasoconstriction may be caused, or even followed in certain cases, by abdominal venous stasis. Whatever may be the primary cause of the phenomena, the blood once collected to a certain extent in the visceral veins, there results a condition similar to that in hæmorrhage, and shock is produced by anæmic auto-intoxication.

Besides the shock by momentary hyperexcitation of the vasomotor centers, low blood-pressure and shock may result from primary or secondary inhibition or secondary auto-intoxication.

Immediate shock by inhibition which is rarely observed depends on: (1) the intensity of nervous excitation (nervous traumatic concussion, etc.); (2) the excited area (shock of the abdominal sympathetic); (3) low blood-pressure previous to injury.

Secondary inhibition, occurring about two hours after injury, passes through two stages: the first stage of general post-traumatic excitation with increased arterial pressure, cardiac insufficiency, and hypertensive asystolia; the second stage of low pressure by relaxation of the whole vasomotor system. Secondary shock sometimes is due to auto-intoxication of the cardiovascular apparatus by anæmia, toxæmia, etc.

The treatment of the shocked or those susceptible to it consists in: (1) saving as much blood as possible by employment of a tourniquet by abdominal compression against venous stasis, ligature if there is hæmorrhage, and the injection of salt solution or blood transfusion; (2) saving pain during transport; (3) heating the shocked patient. W. A. BRENNAN.

**Janney, N. W., and Isaacson, V. I.: The Blood Sugar in Thyroid and Other Endocrine Diseases; the Significance of Hypoglycæmia and the Delayed Blood Sugar Curve.** *Arch. Int. Med.*, 1918, xxii, 160.

It is generally recognized that the thyroid and other endocrine glands exert an influence on carbohydrate metabolism, but a clear understanding of this function has not as yet been reached. Experimental studies of this subject were accordingly undertaken and are reported in this article.

They demonstrate that following the abolition of thyroid function there ensues: (1) hypoglycæmia, and (2) a tendency to delayed blood sugar tolerance curve. Clinical studies on hypoglycæmia and the blood sugar tolerance were also made in a series of thyroid and other cases. This paper presents a detailed account of these observations which emphasize the value of blood sugar estimations in the study and diagnosis of endocrine diseases.

It was decided to study the effect of thyroidectomy in animals, avoiding the uncertainty of former investigations by: (1) the employment of careful surgical technique; (2) by tolerance studies made with the aid of a delicate blood sugar tolerance test; and (3) by using a sufficient number of animals to render the results of value.

The sugar tolerance was tested by a specially devised modification of a similar procedure recently worked out by the authors for human subjects.

After a careful study of the subject the authors have reached the following conclusion:

Experimental proof that hypoglycæmia results from hypo-endocrine function was obtained in the case of the thyroid gland, where hypoglycæmia regularly developed after thyroidectomy. Explanation is thus afforded for the low blood sugar value observed in myxœdema, cretinism, Addison's disease, pituitary disease, and other less clearly defined endocrine conditions such as muscular dystrophy.

The increased tolerance to glucose as determined by testing the urine in such diseases of the ductless glands is probably to be best explained as due to the hypoglycæmia present in these conditions.

Delay in the assimilation of glucose from the blood was found to follow thyroidectomy in animals by employment of a blood glucose tolerance test. The same change was demonstrated in cretinism, exophthalmic goiter, and hypophyseal disease. Determination of the fasting blood sugar value and the blood glucose test are useful in the diagnosis of endocrine disease.

GEORGE E. BEILBY.

**Simonds, J. P.: A Study of the Low Blood-Pressure Associated with Anaphylactic and Peptone Shock and Experimental Fat Embolism, with Special Reference to Surgical Shock.** *J. Exp. Med.*, 1918, xxvii, 539.

In a preliminary report attention was called to certain fundamental differences between the low blood-pressures associated with peptone shock and experimental fat embolism. Consideration of these differences is important because they have a direct bearing upon certain theories as to the etiology and mechanism of surgical shock. In this paper Simonds gives in detail the experimental data upon which some of the statements made in that report were based, adds new observations, and discusses the results obtained. The theories concerned are that surgical shock is due to loss of vascular tone in the splanchnic region, that it is due to loss of peripheral vascular tone, and that it is due to fat embolism.

All the experiments here reported were made upon dogs under ether anæsthesia. Altogether, more than thirty-five animals were used in the study of the problems involved. The arterial pressure was taken from the carotid artery according to the usual technique.

From the results of these experiments and from a study of the subjects Simonds makes the following summary:

1. In peptone shock there is a marked precipitate fall in arterial pressure. At the same time there is a fall in venous pressure.

2. In experimental fat embolism, (a) the fall in blood-pressure is always gradual; (b) approximately 1 ccm. of oil for each pound of body weight must be injected before a lasting fall in arterial pressure is

produced; (c) it makes only a slight difference whether this amount is injected in small doses at a time or in relatively large quantities; and (d) when the arterial pressure falls, but not until then, the venous pressure rises.

3. In peptone shock, dyspnoea by its suction and force-pump action upon the reservoir of stagnating blood in the liver brings more blood to the heart and causes a rise in arterial pressure. By repeatedly inducing short periods of dyspnoea at frequent intervals, permanently beneficial results are obtained and the life of the animal can be saved.

4. In experimental fat embolism, dyspnoea will cause a rise in blood-pressure. But permanently beneficial results have not been obtained by this method. Since Simonds found dyspnoea to bring permanent improvement in surgical shock, it is indirect evidence that this condition is not due to fat embolism. Respiratory suction is probably not responsible for the rise in blood-pressure in experimental fat embolism. Simonds concluded that the dyspnoea in some way facilitates the passage of blood through the embarrassed pulmonary circulation. Artificial respiration with a bellows will also frequently cause a rise in blood-pressure in experimental fat embolism.

5. In peptone shock the respiration is usually not affected, although there is some evidence that the respiratory center may be in a state of increased irritability. Simonds further discovered that in experimental fat embolism in some animals a violent dyspnoea develops spontaneously. This is usually accompanied by oedema of the lungs. In other instances, an apnoea occurs, even before the blood-pressure has begun to decline.

GEORGE E. BEILBY.

#### SERA, VACCINES, AND FERMENTS

**Bazy, L.: Remarks on the Serothapy of Gaseous Gangrene** (Remarques sur la sérothérapie des gangrènes gazeuses). *Bull. et mém. Soc. de chir. de Par.*, 1918, xlv, 1213.

For the past two years Bazy has pursued the study of antigangrenous serotherapy. He thinks the reason that the treatment is not more widely used is because its limitations and applications are not sufficiently understood.

Bazy thinks there is no unique type of gas gangrene but rather several gas gangrenes, the clinical features of which might be differentiated, due to the bacillus perfringens, the bacillus bellonensis, the bacillus oedemeticus, and the septic vibron especially, each of these germs being capable of evoking a particular form of gas gangrene, or rather gangrenous septicæmia, association of the germs not being necessary. A clear classification of the different septicæmias is very desirable. Certain experiments already carried out by Bazy in conjunction with Vallée have established the facts, for instance, that the bacillus perfringens attacks muscle, while the vibron provokes oedema only with subcutaneous phlyctenæ.

Antigangrenous serotherapy therefore is not aimed against one form of disease, but against conditions provoked by different pathogenic agents. There can be no question of a specific serum except in cases where the specific clinical symptoms are known and recognized. The various gaseous septicæmias are toxic affections, and those forms of the disease provoked by a single germ must be distinguished from forms due to a multiplicity of germs.

The particularly rapid evolution of gangrenous septicæmia necessitates the use of serum as soon as possible before the appearance of toxi-gangrenous phenomena, as the preventive action is always more certain than the curative.

Bazy thinks that in order to be sure of reaching the true agent of gangrenous septicæmia, all the germs capable of causing it must be attacked. But it is well to know the relative frequency of these germs. Sacquépée in 57 examinations found the vibron and the perfringens either alone or associated in about 70 per cent of gas gangrene cases. It should suffice then to use a mixture of sera, or better, one active serum against the septic vibron and the perfringens in the majority of cases. A polyvalent serum would be the most practicable, as it would furnish the organism with all the antimicrobial and antitoxic antibodies to fight the germs of gangrenous septicæmia. Such a polyvalent serum is available as the result of the researches of Leclainche and Vallée, who since 1898 have continuously worked and published their researches on this subject.

W. A. BRENNAN.

**Duval, P., and Vaucher, E.: Preventive Antigangrenous Serotherapy** (Essai de sérothérapie antigangreneuse). *Bull. et mém. Soc. de chir. de Par.*, 1918, xlv, 1187.

In a bacteriological study of 18 cases of gaseous gangrene of which 13 were fatal, the authors found anaerobic microbes as follows: bacillus perfringens, 18 times, 13 fatalities; bacillus oedemeticus, 6 times, 6 fatalities; septic vibron, 3 times, 2 fatalities; bacillus sporogenes, 13 times, 11 fatalities; bacillus fallax, 1 time, 1 recovery; bacillus histolyticus, 1 time, 1 fatality.

The bacillus perfringens, bacillus oedemeticus, and the septic vibron are the most formidable microbes and it is against these three especially that preventive serotherapy must be directed.

The authors' first experimental trials of serotherapy were made in severely wounded soldiers, generally lower limb fracture cases complicated by large vascular lesions and several with incipient symptoms of gangrene. Fifty such cases were selected; 25 of these died within twenty-four hours on account of their condition but did not show any signs of gaseous infection. The others have all been evacuated without development of gangrene. The injections were usually made 5 to 6 hours after injury. Antiperfringens, anti-oedemeticus, or antivibron sera were used either separately or in some cases combined, 10 ccm. of each kind being used, or 30 ccm. of the combination.



In a second series of 37 wounded, 21 arrived in good clinical condition. All were severely wounded and they received their injections in from sixteen to twenty hours after injury and were operated upon immediately. All have recovered and no amputations have been necessary.

Eight cases arrived fully infected, about twenty hours after injury. They received doses of 40 ccm. of serum and were operated upon. No case of gangrene developed, but 2 died within 21 days of streptococcal septicæmia. Four cases arriving in bad clinical condition received their preventive injections and were operated upon but nevertheless developed gangrene. Four cases which arrived at the ambulance in such a state that they could not be operated upon were injected with the preventive sera. All 4 cases developed gangrene and died.

The first finding which draws attention is the rapidity of the development of the anaerobics, since in 14 cases out of 37 the men arrived with full local anaerobic infection, 10 of them already showing signs of general intoxication.

Experiments have shown that even the most active antitoxin will not save after inoculation of a fixed dose of toxin if the injection is late. A rabbit injected with a fatal dose of the perfringens, œdematicus or vibron can in general be saved if the serum injection is made from four to six hours later. It is therefore of extreme importance that the preventive injection be made as quickly as possible.

At the advanced posts all likely cases should receive: 20 ccm. of antiperfringens serum; 10 ccm. of anti-œdematicus serum; 10 ccm. of antivibron serum. The doses should be increased to 30, 30, and 20 ccm. in cases with multiple wounds of the thigh or leg. If surgical operation is deferred, the dose ought to be repeated. The fact that a preventative injection of serum has been made should in no way delay operation. Serotherapy can only be considered as complementary to surgery. At least three sera should be used, as the particular type of infection cannot be rapidly determined. The authors have not found that the use of the sera, even in massive doses, has in any case caused complications. Where gaseous gangrene is fully manifested, strong doses must be quickly injected and repeated. Such injections should be intravenous and may be made even during an operation.

The authors draw the following conclusions:

1. Preventive serotherapy of gaseous gangrene is absolutely justified by the results.
2. Serotherapy is only complementary to the necessary surgery, is subordinate to it, and must in no way retard or interfere with its course.
3. Serotherapy seems to have a real curative effect.
4. It is desirable that preventive antigangrenous serotherapy should be organized in the army. The demonstrated facts are now sufficiently numerous to call for this action.

The authors use the antitoxic sera prepared by Weinberg and Séguin.

W. A. BRENNAN.

## BLOOD

**Sicard, J. A.: Subcutaneous Homohæmotherapy**  
(Homo-hémothérapie sous-cutanée). *Presse méd.*,  
Par., 1918, xxv, 304.

Animal sera have in general been employed in the organotherapy of pathological conditions of the blood, and they often have anaphylactic results which necessitate discontinuance. However, certain cases benefit very materially from injections of whole blood. The author thinks homohæmotherapy is the preferable method when the proper conditions can be realized.

In 1912 the author described a method of auto-hæmotherapy for epilepsy with favorable results. He now thinks that homohæmotherapy can be employed in hæmorrhagic and hæmophilic diatheses, or in certain anæmic states. This is quite distinct from the large blood transfusions from vessel to vessel.

The donor is generally a relative and must fulfill the usual conditions for a blood donor. Both donor and recipient are placed in horizontal decubitus. About 30 ccm. of blood are taken from the donor and collected in a sterilized paraffined tube, and injected in the abdominal subcutaneous tissues of the recipient. By using several needles and taking the blood from different veins, as much as 80 to 120 ccm. of blood can be subcutaneously injected in a few minutes. A hæmatoma is formed which may take from three to five weeks to become absorbed. But this absorption is usually effected normally and without any infective or cystic complications.

During the past four years the author has treated three cases of toxic infection with purpura and internal hæmorrhage, 2 cases of hæmophilia, also a number of chloranæmic patients, and 3 cases of extreme anæmia after severe hæmorrhage. In all the cases marked benefit was derived from the treatment. The amount of blood injected each time was usually 100 ccm., and this was continued for three or four treatments.

W. A. BRENNAN.

**Bloomfield, A.: The Results of Treatment of Pernicious Anæmia.** *Bull. Johns Hopkins Hosp.*, 1918, xxix, 101.

The treatment of pernicious anæmia, generally employed until a few years ago, consisted of a regimen in which rest, special diet, and the administration of arsenic were the principal features. Recently more radical measures have come into prominence, namely, transfusion of blood, splenectomy, and operations for the elimination of foci of infection. The reports on these newer methods have dealt so far mainly with general considerations and immediate results.

Inasmuch as these procedures are elaborate and at times not without immediate ill effects, it seems important to have more information as to their value in prolonging life or inducing remissions. In this report a series of 57 cases has been analyzed in detail with particular reference to the comparative

value of the various methods of treatment. All the patients were studied in the Medical Clinic of the Johns Hopkins Hospital and were selected serially from the records of the past five years. In every instance the history, physical findings, and the blood picture were typical of the so-called idiopathic type of pernicious anemia.

An effort has been made to analyze the results of treatment in these cases from a purely objective point of view. Clinical impressions have been disregarded, and no attempt has been made to promote or discredit any particular therapeutic measure. It should be recognized that such statistics lead only to general conclusions, which allow of exceptions in individual cases. The results may be summarized as follows:

1. No definite evidence has been found that either transfusion, splenectomy, or elimination of foci of infection prolongs the life of patients suffering from pernicious anemia.

2. Transfusion performed at a time when the patient was not refractory brought on remission in about half the cases, and enabled the blood count to be raised to a higher level than it reaches in cases not so treated.

3. Such artificial plethoras did not increase the duration of the remission, although the patients usually had a sense of well being while the count was high.

4. At other times the same patients were refractory to transfusion as well as to other methods of treatment.

5. The central nervous system symptoms were as little benefited by splenectomy as by other methods of therapy.

6. Transfusion of blood was not "held" better after splenectomy than before. GEORGE E. BEILBY.

#### BLOOD AND LYMPH VESSELS

**Bridgman, E. W., and Hirose, K.: The Effect of Diuretics on the General Blood-Pressure in Animals with Constriction of the Renal Arteries.** *Arch. Int. Med.*, 1918, xxi, 351.

Since the days of Traube a mechanical explanation for the high blood-pressure of chronic renal disease has frequently been advocated, the original theory postulating increased peripheral resistance in the kidney itself as the cause. Failure of ligature of both renal arteries to raise the blood-pressure materially was sufficient disproof of the theory in any such simple form.

Various modifications of it have been suggested. Katzenstein obtained a slight rise after incomplete occlusion of the renal arteries, and Alwens by compressing the kidneys in oncometers. In spite of the failure to produce any rise in blood-pressure at all comparable to the hypertension of human nephritis, the obvious association of hypertension with those types of renal disease in which the renal arterial system is most compromised, in the absence of any other satisfactory explanation, has prevented the

entire abandonment of the mechanical theory. Furthermore, clinicians have always been impressed with the compensatory nature of hypertension.

The following experiments were undertaken by the authors in the hope of affording further light on the tenability of Traube's theory under conditions of increased functional demand on the kidney. It was thought possible that, if the renal artery were narrowed, but not occluded, and then diuretic substances administered intravenously, the compensatory nature of hypertension might be revealed. Narrowing of the renal artery without obliteration was made possible by the aluminum band of Halsted. The diuretic substances used were sodium chloride urea and caffeine, injected intravenously; in addition, the effect of epinephrin was tested. With an aluminum band placed about the renal artery, no increased flow through the kidney can occur as a result of mere local vasodilatation. If any reflex mechanism exists whereby diuretic substances can produce an increased flow through the kidneys under these conditions, a rise in general blood-pressure must occur. If, on the other hand, no rise in general blood-pressure and no diuresis follows, then the evidence for this particular view of the compensatory nature of hypertension would be lacking.

The results of their experiments carried out on dogs were negative. They give no support to the view that hypertension in chronic renal disease is a compensatory mechanism, brought into play when the renal arterial stream-bed is narrowed, by chemical or reflex paths, to counteract the effect on excretion of the locally diminished blood flow. Their value is only that of negative evidence in general. They do not disprove the compensatory nature of hypertension, but show that its demonstration is not to be had by the experimental method employed.

A similar study of animals in whom a constricting band had been left for a considerable period around the renal artery, stimulating a chronic lesion, would be of interest, but external events prevented the authors from undertaking it. GEORGE E. BEILBY.

**Fiolle, J.: Segmental Inhibition of the Arteries in War Wounds** (*L'inhibition des artères dans les plaies de guerre*). *Bull. et mém. Soc. de chir. de Par.*, 1918, xliv, 996.

In the case of a wounded soldier following a traumatism of the vessels of the upper thigh, Fiolle found the femoral vein sectioned and a peculiar condition of the artery which he terms "segmental inhibition." The artery preserved its anatomical integrity; it was hard, reduced in volume, and there was no pulsation. Above the level of the trajectory of the projectile the artery was normal. The affected arterial segment was resected but showed no signs of lesion of its internal wall nor any coagulation. It seemed perfectly normal. The only parallel that Fiolle can find is the effect of peri-arterial sympathectomy described by Leriche. In this there is contraction and usually disappearance of the periphic pulse but not complete absence of circulation.



This case shows that in war wounds traumatism of the peri-arterial sympathetic plexus causes segmental contraction of the artery and total or partial suspension of circulation in the vessels. This condition, which up to the present time might have been considered a severe contusion of the artery with lesion of its internal tunic with or without intravascular coagulation, may only be a simple segmental contraction of the vessel without any lesions of its coatings and without intravascular coagulation. But it is a matter for consideration whether this segmental inhibition may exist alone or whether there is an accompanying contusion or internal rupture. Simple inhibition should be treated by reconstitution of the peri-arterial sheath after lavage with warm serum, and contusion with internal rupture by resection.

Fiolle says that at present there is no means of distinguishing pure inhibition from inhibition with internal lesions, by studying the external aspect of the vessel, but the study of new cases as they arise may furnish some indications.

The discussion appeared to show that severe contraction of the artery under operative or other traumatism of its sheath was physiologic and that such contraction, even with the cessation of all pulsation and signs of circulation, was not an indication in itself for resection of the vessel.

W. A. BRENNAN.

**Gadaud, F., and Jeanneney, G.: Oscillometry in the Diagnosis of True Aneurisms and Encysted Hæmatomata** (*L'oscillomètre dans le diagnostic des anévrysmes vrais et des hématomes enkystés*). *J. de méd.*, Bordeaux, 1918, lxxxix, 192.

It is often difficult to differentiate between an arterial aneurism and an encysted arterial hæmatoma. But the necessity of differentiation is evident since in true aneurism it is possible and even at times well to temporize, while in hæmatoma the injured vessel ought to be operated upon at once.

In a case reported by the author the clinical symptoms were insufficient to establish the diagnosis; but by means of oscillometric exploration as a complement to the examination of the patient, the lesion was seen to be not an aneurism in the course of development, as was believed, but an encysted arterial hæmatoma.

With the Pachon oscillometer the surgeon obtains valuable data in the diagnosis of different types of vascular lesions.

W. A. BRENNAN.

**Ransohoff, J.: Hæmorrhage from an Aneurism of the Internal Carotid Artery, Following Septic Sore Throat.** *Ann. Surg.*, Phila., 1918, lxxviii, 152.

The author points out that although hæmorrhages are almost invariably arterial in character, exceptions do occur; and he states that the carotid artery has been tied for hæmorrhage following septic sore throat which autopsy showed to have been due to an erosion of the internal jugular vein.

He also cites a case of Dandridge, a gunshot wound

of the neck, in which the common carotid artery was tied for hæmorrhage. Autopsy revealed a wound of the vertebral.

The author maintains that although this condition is alluded to by all classical authors, the cases are far from common, and he regards it as rather remarkable that 2 out of the 51 cases collected by Newcomb from literature extending over a period of fifty years should have come under his attention, one with a quickly fatal result, the other fortunately saved.

He accounts for these diametrically opposite end-results by the fact that in one case a false aneurism was formed, while in the other the bleeding was so profuse from the moment the artery gave way that there was no time for such formation. He regards the one case as especially interesting because aneurisms of the internal carotid, even of false type, that are not intracranial are very uncommon. The intracranial variety, as evidenced by pulsating exophthalmos, are not at all rare, but the extracranial internal carotid aneurisms are extremely rare. The great rarity of this type of case has also been emphasized by Shipley and Linn after a careful search of the literature.

He also cites Babio who found only 18 cases of aneurism of the internal carotid reported in the literature. In these the common carotid was tied 11 times, with 5 deaths. Matas also maintains that these aneurisms are very rare and are often mistaken for other conditions, with fatal results. Of 11 cases collected by Werner, only 6 were correctly diagnosed before treatment.

The author concludes that in the treatment of aneurisms of the extracranial internal carotid, the cases must be extremely rare in which any other treatment than the tying of the common artery would be applicable.

H. J. VAN DEN BERG.

**Tubby, A. H., and Banister, J. B.: Traumatic Aneurism of the Second Portion of the Subclavian Artery; Operation.** *Lancet*, Lond., 1918, cxciv, 902.

A soldier was wounded just below the middle of the right clavicle on November 2, 1917, by a tiny fragment of shell. Immediately there was some numbness in the arm and the lower part of the neck was slightly swollen. The swelling lessened for a few days, but some difficulty in swallowing and speaking ensued. An X-ray examination showed a minute fragment of metal situated immediately behind the clavicle and moving with respiration.

The swelling continued to increase in size and on November 26 the swelling was rapid and there was pulsation. The tumor presented all the signs and symptoms of an aneurism; the bulk of the swelling was above the arch of the subclavian vessels.

Operation was performed November 29. After division of the sternomastoid muscle a very voluminous internal jugular vein was seen to obscure the common carotid artery. This vein was traced down to its junction with the subclavian vein and both were

adherent to the false sac and were dissected free. In doing so a puncture was made at the juncture of these veins and a lateral ligature was applied. The scalenus anticus and phrenic nerves were dissected from the aneurismal sac and retracted outward. The upper end of the aneurism was ligated. The clavicle was divided at the middle and its inner half turned inward.

In clearing away the structure on the outer side the sac gave way and a great gush of blood followed, which was controlled by pressure with the finger. A ligature was placed around the subclavian artery distal to the aneurism, the clavicle replaced, the muscles and wound closed. The operation lasted two and one-half hours; the patient died the same day.

At autopsy there was a hole the size of a pea between the ligatures on the anterior aspect of the artery, made by the fragment of shell.

V. C. HUNT.

**Okinczyc, J.: Vascular Wounds and Their Immediate and Late Complications in War Surgery** (Les plaies vasculaires et leurs complications immédiates et tardives en chirurgie de guerre). *J. de chir., Par.*, 1918, xiv, 441.

In operating upon 220 successive cases of wounds of the face, neck, and limbs, the author found 53 with associated vascular wounds. Some of these were multiple vascular wounds, the total number being 79, or about 36 per cent. The radial, tibial, humeral, and popliteal vessels are most frequently found injured.

The association of arterial and venous lesions is the rule, especially in vessels of medium caliber and in the limbs where an artery is flanked by two anastomosing veins.

The factors which particularly disturb the evolution of vascular wounds are concomitant nerve lesions and injuries of the soft parts, both of which affect the establishment of collateral circulation; the general state, i.e., a condition of anæmia, is also an important factor.

Ignored vascular injuries, i.e., the so-called "dry" vascular wounds, tend to become less frequent thanks to the general practice of early opening up of war wounds and especially the extensive excisions which lead to the discovery of such lesions. The capricious trajectory of a projectile and the absence of primary hæmorrhage or hæmatic swelling frequently hide an important injury of one of the larger vessels. Exploration of the vessels and the vascular region for these dry wounds should be a clinical and operative routine.

The indications for such a search are given by: (1) the trajectory of a projectile crossing a vascular line; (2) the radioscopic examination which localizes a projectile in or near a vascular region; (3) spontaneous or provoked pain in a vascular tract. This pain can very often be exactly localized and it is all the more remarkable because apart from fractures, war wounds are not in general immediately spontaneously painful.

Regarding treatment, when an important vascular lesion is found, despite the fact that Makins and others have shown much more favorable results from simultaneous ligature of artery and vein than from ligature of the artery alone, Okinczyc is not convinced of the absolute advantage of this method. While he never observed gangrene following quadruple ligature in old arteriovenous lesions, in 7 cases of simultaneous ligature of vein and artery for recent lesions he found massive gangrene in 3 and partial gangrene in 1. The time elapsed since injury in these cases was from four to fifteen hours.

Okinczyc thinks that vascular suture is the procedure of choice when circumstances permit. Unfortunately circumstances frequently limit its application, as time and the patient's condition are the important factors. The operation is long and difficult and the suture must be done in absolutely healthy vascular tissue. While satisfied that arterial intubation has many indications, the author has not had the opportunity to practice it.

He gives histories of 20 cases of arterial and arteriovenous aneurisms which he treated. These were secondary to untreated vascular lesions, the time elapsed since injury varying considerably, running from a few days to a couple of years. In the case of arteriovenous aneurisms the procedure was quadruple ligature supplemented by ligature of collaterals when necessary and extirpation of the aneurism; in arterial aneurisms, double ligature and extirpation. There was only 1 death, an operation of urgency in a desperate case, and no recurrences nor disturbances in the circulation were noted. W. A. BRENNAN.

**Le Fort, R.: How the Large Vessels React to Old Projectiles Lodged Within or in Contact with Their Walls** (Comment se comportent les gros vaisseaux vis-à-vis des projectiles anciens inclus au contact de leurs parois). *Bull. Acad. de méd., Par.*, 1918, lxxix, 443.

The elastic tissues of the large vessels easily arrest spent projectiles. Although it is common to find projectiles embedded in the vascular sheath, yet hæmorrhages arising from this are rare. A careful examination of cases establishes the fact that a projectile only invades or perforates a vessel when the vessel cannot escape from it, which rarely happens when a projectile is small in size.

Secondary or late vascular ulceration about a projectile is almost always a septic phenomenon, as bullets, etc., even though well tolerated for a long period, preserve microbes on their surface which set up infective processes in their neighborhood. This is the cause of the hæmoptysis which carriers of old pulmonary projectiles show.

There are three methods of defense of the vessel against such dangers, according to Le Fort: (1) a part of the circumference of the vessel and the projectile are surrounded by and embedded in sclerous connective tissue; this commonly occurs in veins, more rarely in arteries; (2) in the case of arteries usually the projectile becomes embedded in a more



or less thick sclerous tissue separated from the elastic layers of the artery by a cleavage plane which acts as a serous bursa and obviates friction; it is an admirable protection; (3) a small projectile may be embedded in a thickened arterial wall preserving a soft adventitia and free from adhesions to the sheath.

These methods of defense are effective not alone against hæmorrhage but also in preserving the vascular function. Neither thrombosis nor vascular occlusion are more frequent than delayed hæmorrhage. Even partial penetration of a projectile into the lumen of a vessel should be very rare, especially in old cases. It may be seen, of course, in fresh cases.

It is well to bear these facts in mind when seeking indications for the removal of projectiles in the vicinity of blood-vessels. The pulsation of a projectile embedded in the tissues is not of itself an indication for operation.

W. A. BRENNAN.

### POISONS

**Speed, K.: Recurring Tetanus.** *Med. & Surg.*, 1918, ii, 499.

The author reports an interesting case of recurring tetanus in a patient reported ill in the field ambulance January 19, 1918.

Eight days before, the patient suffered from pain in the back, and four days later had difficulty in opening his mouth. He had sustained no wound, had no abrasion or ulcer anywhere on the body, nor had he trench-feet. His temperature was 98° F., and his pulse was 70. A provisional diagnosis of tetanus was made and he arrived at the general hospital January 25, 1918, with additional stiffness and rigidity of the neck and thigh muscles. His tendon reflexes were present and normal and he could open his mouth about half an inch.

At the field ambulance he had been given 3,000 units of antitetanic serum on January 21; at the base he received 1,500 units every day for one week.

On inquiring into his past history, it developed that he had been wounded August 15, 1916. His wound consisted of a lacerated area on the inner side of the left knee which was not operated upon at that time. His first injection of antitetanic serum had been nine hours after the injury; a second dose followed while he was in France.

On August 24 he arrived in England and received the third dose of antitetanic serum. In September his wound was reported as clean and healed.

On October 19 he complained of a pain in the back and difficulty in opening his mouth. A diagnosis of pseudotetanus was made and another 1,000 units of antitetanic serum were given him on October 25. On October 30 the mouth spasms became more marked, accompanied by cyanosis and profuse sweating, and he developed a foul sloughing ulcer on the left side of the tongue. On the night of the 30th a diagnosis of tetanus was made and 30,000 units of serum were intravenously injected under chloroform anaesthesia. His temperature at that time was 99° F., and his pulse 98. He is described as

sitting propped up in bed, his head drawn backward, with the back somewhat arched and the muscles of the back of the neck and spine in a state of tonic contraction. The masseter muscles were also in spasm, but the mouth could be opened a very little.

The abdominal muscles were contracted and hard, and the left hip was forcibly flexed with a tonic contraction of the left hamstring muscles and the left gastrocnemius. Plantar stimulation produced violent spasms of the leg muscles which spread to the muscles of the lumbar spine. Upon tapping the patellar tendon there followed a short but violent spasm of the quadriceps extensor of the thigh. Ten hours after the intravenous injection of the serum he was again anaesthetized and specimens of blood were taken from the arm and cerebrospinal fluid withdrawn by lumbar puncture. Recovery, which was slow in character but apparently complete, followed and he was discharged for duty on February 5, 1918.

Experiments were carried out on guinea-pigs and proved beyond doubt that the tetanus toxin used was virulent and that the patient contained both in the cerebrospinal fluid and in his blood an excess of free antitoxin.

This case has several features of interest. There was a long period of incubation. The symptoms came on slowly and insidiously, and the diagnosis remained in doubt for a long period. The symptoms gradually became more definite, and the condition was ultimately typical of a severe type. A single large dose of antitoxin, injected into the vein, resulted in a satisfactory cure.

At the time of his second tetanic attack, the old wound was not X-rayed for the possible presence of a foreign body, but the author explains that this was done later and a foreign body found, which was removed. Whether or not this will have any influence on future attacks in this patient's case will be interesting to note. Consideration was given to the fact that he might have been a tetanic carrier. His bowels had been regular, he had no constipation of note, nor had he eaten unwashed vegetables.

Failing in access to the literature on the subject and handicapped by the lack of complete laboratory facilities which might lead to scientific study of a case such as this patient presented, it was necessary to let him depart without further study.

The author believes that if any foreign body remains in the wound, no matter how small, it should be removed; and should symptoms ever appear again, the scar of the original wound should be widely excised, as it may harbor bacteria for years.

E. C. ROBITSHEK.

### ROENTGENOLOGY

**McKenzie, D., and Knox, R.: Stereoscopic Radiograms to Illustrate the Anatomy of the Temporal Bone, and Particularly the Fallopian Canal.** *Arch. Radiol. & Electrotherap.*, 1918, xxiii, 18.

Stereoscopic roentgenograms of the temporal bone were made with a wire in the fallopian canal in

order to illustrate the relationship of the canal to the other constituents of the bone. Temporal bones in adults, in children at the age of eleven years, and at birth are illustrated, and detailed descriptions accompany them. ADOLPH HARTUNG.

**Eisen, P.: Application of the X-Rays in Defining and Studying Kidney Tumors.** *Am. J. Roentgenol.*, 1918, v, 329.

The author has examined a large number of kidney tumors by means of the roentgen ray with definite findings in all those which were palpable. The size and shape was generally shown, as well

as the presence of calcareous deposits. Insertion of a shadowgraph catheter and the making of stereoscopic plates assisted in the localization. Where fistulous sinuses were present, injecting them with bismuth paste and examining stereoscopically was of distinct value in determining their point of origin. Pyelograms also gave much information, especially if stereoscopic exposures were made. Injection of an opaque enema showed the relationship of the colon to the tumor mass and permitted of definite conclusions as to the origin of the tumor mass by virtue of the displacement it caused and noting where it lay. ADOLPH HARTUNG.

## MILITARY SURGERY

NOTE.—Readers are referred to the Table of Contents for other articles dealing with military surgery which appear under the various headings according to our anatomical arrangement.

**McMurtrie, D. C.: Reconstructing Crippled Soldiers of France.** *N. Y. M. J.*, 1918, cvii, 840.

The author regards the medical and surgical treatment given wounded soldiers as only the first step in the process of reconstruction, and believes that this work can only be completed when the soldier has been made into a capable, self-supporting worker, and his self-respect and happiness which can only come through useful activity, be restored.

He gives a somewhat detailed account of the French reconstruction methods, and makes special mention of Edouard Herriott, mayor of Lyon, who was the first to propose serious vocational training, and who opened the first municipal school for disabled soldiers in December, 1914, with an enrollment of but three pupils. Today there are over one hundred such schools. The importance of this work was soon recognized by the French Government, and in March, 1916, a National Office for Disabled and Discharged Soldiers was created.

The author regards the plan adopted by this bureau as a most excellent one. They have established a "center of re-adaptation" in every part of France, to which can be sent men native to that region and where, when practical, trades are taught that are peculiar to that locality. Each complete center of re-adaptation should include: (a) a hospital of physiotherapy where the invalid receives "functional re-education," or the treatment which will give him back the greatest possible use of his muscles; (b) an "apparatus center" where artificial limbs and other appliances are manufactured and distributed; and (c) a center of vocational re-education.

The author believes that in all well planned re-educational work there should be an investigation of the state of the industry before any trade is offered as an occupation; and that not only the nature of the disability should be considered, but also the patient's general health, his native intelligence, his schooling, and his adaptability. He believes whenever possible

he should be given some work connected with his former trade, so that he can reap some advantage from his previous knowledge and skill.

H. J. VAN DEN BERG.

**Geist, E. S.: The School of Clinical Military Orthopedic Surgery.** *Am. J. Orthop. Surg.*, 1918, xvi, 488.

The school is located at Camp Greenleaf. The objects of the school are as follows: (1) the making of intelligent assistants for foreign and domestic service; (2) the making of efficient camp orthopedists; (3) the making of efficient base hospital orthopedists; (4) furnishing a groundwork for future training in orthopedic surgery in other centers.

The duration of the course is four weeks of intensive instruction. After their arrival at Camp Greenleaf the medical officers are first given a four to six weeks' course of training in those subjects which it is necessary for every military medical man to know, such as drill, physical training, military hygiene, etc. During this time, those most fitted for orthopedic surgery are assigned to the orthopedic course. A new class of 25 is admitted each month.

Orthopedic surgery has the following points to solve in the war: (1) helping in an orthopedic way to make the army fit for service; (2) helping to keep it fit; (3) treatment and reconstruction of the wounded and disabled. The presence of a large body of troops at Chickamauga Park has made it possible to effectively teach the first two subjects, and as yet there has been no clinical material from the war to teach the last phase. It is hoped that the school will soon have access to a large reconstructive hospital. The clinical material now accessible is of the peace time variety.

The central theme in these courses is prevention of deformity. Anatomy, especially bone, joint, and epiphyseal anatomy, together with functional muscular anatomy and the distribution of the peripheral nerves is absolutely demanded. Every student offic-



er is required to make nearly every splint in Manual No. 4. Wire is used as the basic material chiefly. They are also taught designing braces. A course in foot ailments is given. Current orthopedic literature is abstracted and discussed.

In the February class, 120 original articles appearing in last year's literature were abstracted. A review of bone and joint pathology, including healing of fractures, is given. The orthopedic material consists of 75 to 100 ward patients, with a number of outpatients. Class No. 4 is now being instructed. Operative instruction has been negligible. The number of operative cases has been very small.

J. J. KURLANDER.

**Forgue, E.: Cancer and the War** (Le cancer et la guerre). *Bull. Acad. de méd., Par.*, 1918, LXX, 84.

Although traumatism is the most powerful factor capable of developing cancer, yet critical examination shows that a traumatism of itself cannot cause cancer in a healthy organism; the rôle of traumatism is limited to accelerating or aggravating a pre-existing tumor or making a latent tumor manifest.

Statistics of the war show that most frequently sarcoma results from a single and abrupt trauma, while epithelioma results from repeated and chronic irritations. Such are the cutaneous irritations due to exposure, the chronic inflammations of old scars and fistulous tracts, and the irritations of the mucosæ by alcohol, tobacco, bad teeth, syphilis, etc.

In the French Army the number of claims for pension arising from cancer cases since the onset of the war has been relatively small. In 200,000 such claims, less than 500 have had cancer as the basis of the claims. More than half of these cases are cancers of the digestive tract, and cancer of the stomach is in the first rank.

With regard to age, the conditions of war have

necessitated the drafting of men up to the fiftieth year. The proportion of cancers in young men up to the thirtieth year is small; from the thirtieth to the thirty-fifth year the frequency is tripled; from the thirty-fifth to the fortieth year the figure doubles again; the maximum frequency is found from the fortieth to the fiftieth year, and half of the total claims are from men of this age.

While formerly it was the rule to exclude any connection between the incidents of army service and cancers, a more benevolent view is now taken, traumatism, defective alimentation, and even fatigue being admitted as contributing factors; and the claims being disposed of accordingly. Hence responsibility has been admitted in more than half of the total claims for compensation. W. A. BRENNAN.

**Algave: Delayed Primary Suture of War Wounds Done at a Great Distance from the Front** (La suture primitive retardée des plaies de guerre du front). *Bull. et mém. Soc. de chir. de Par.*, 1918, XLIV, 1176.

Algave reports 51 cases of war wounds which had been operated upon and dressed at the front but were for some reason evacuated to interior hospitals without being primarily sutured. Algave sutured these wounds without bacteriological control, being directed only by the clinical aspect of the wound and the apyretic condition of the patient.

The suturing has been done in 17 cases after five days; in 13 cases after six days; in 2 cases after seven days; in 7 cases after eight days; in 4 cases after nine days; the others being done up to 14 days after the primary operation.

In most cases the wounds were sutured without the use of an anæsthetic. The results were good in all cases. There were no failures. W. A. BRENNAN.

# GYNECOLOGY

## UTERUS

**Macfarlane, W. D.:** Uterine Fibroids, or Myomata of the Uterus Complicating Pregnancy, Labor, and the Puerperium. *Glasgow M. J.*, 1918, vii, 257.

In 13,915 consecutive cases of labor reported by Pinard, only 0.6 per cent were complicated by uterine fibroids. There may be various changes produced by pregnancy on such a tumor. The pedicle of a subserous fibroid may become twisted, due to the softening of the uterine muscle, and torsion of the uterus on its cervix has been recorded. Pregnancy may cause a very rapid increase in growth of these tumors, which may become impacted in the pelvis. Fibroids also undergo changes in shape due to the pressure of the growing ovum.

Fibroids frequently produce abortion, due to the hæmorrhagic change of the endometrium associated with myomata. When situated on the posterior wall of the uterus, such a tumor may produce a retroversion leading to an incarceration of the gravid uterus.

Expectant treatment is all that is required in most of these cases. If operative treatment for the tumor is undertaken, premature labor is likely to result. Operative treatment must be carried out if there be present pressure symptoms, torsion of the pedicle or of the uterus, degeneration of the tumor, or if it is apparent that the tumor is so situated that the child cannot be born by the natural passages.

Considerable bruising of the tumor may result and sepsis intervene from instrumental interference or from pressure of the child's parts. The tumor in turn may cause obstruction of delivery, malpresentation, or hæmorrhage, and these complications must be dealt with as they arise.

Several cases illustrating various complications are reported by the author. He says in conclusion that uterine fibroids complicating pregnancy do not necessarily cause difficult labor, but the knowledge of their presence should keep the medical attendant alive to the fact that operative treatment may be required in place of the usual expectant method.

E. C. Roos.

## ADNEXAL AND PERIUTERINE CONDITIONS

**Corcia, J.:** Report of a Case of Papillary Cystadenoma of the Ovary, Without Recurrence After Seven Years. *Am. J. Obst., N. Y.*, 1918, lxxviii, 62.

The author here reports a case which appeared to be quite hopeless at the time of operation, the peritoneal cavity containing about five gallons of

clear liquid and an extraordinary number of cysts of different size surrounding a central larger cyst. Numerous papillomata extended from these cysts into the peritoneum, intestines, bladder, and to the opposite ovary. This patient is reported as enjoying good health seven years after the operation.

The author accompanies this report with a brief summary of the recent literature. As a result of this study he concludes:

1. Papillary cystic growths must always be considered clinically malignant, because their outcome is not known, but operation may give unexpectedly good results.

2. Early operation is always desirable when a diagnosis of cyst is made.

3. In the advanced state, when there is ascites and great emaciation of the patient, the diagnosis of cyst is difficult, if not impossible, being confused with a general cancerous or tuberculous affection of the abdomen.

CAREY CULBERTSON.

**Schwartz, L. S.:** Papillomatous Cysts of the Ovary, with a Report of 11 Cases. *Am. J. Obst., N. Y.*, 1918, lxxviii, 79.

Accompanying a brief review of the literature covering the etiology and pathology of papillomatous cysts of the ovary, Schwartz presents a protocol of twelve cases which have been operated upon since 1910. Of these cases, three died following the operation, one died two months after, one three months after, and one six months after operation. The subsequent record of one could not be obtained. Of the remaining five, all are living and well, two seven years, one four years, one thirty months, and one eighteen months after operation.

The author regards total extirpation of the uterus and adnexa as the ideal procedure, and considers the prognosis more favorable than is usually believed. Even incomplete removal of the growth with proper drainage may be followed by complete recovery, and repeated operations for recurring growths are of a certain value. Examination of the ascitic fluid as bearing on prognosis and treatment is regarded as well worth while.

CAREY CULBERTSON.

**Polak, J. O.:** A Further Study of the End-Results of the Conserved Ovary. *Am. J. Obst., N. Y.*, 1918, lxxviii, 199.

This second report made by Polak is based upon a study of the pathology found in 73 re-operations for clinical suffering and subsequent disease in the retained ovary. For the sake of comparative study cases have been selected where the uterus and one or both ovaries have been retained after extirpation of the tubes, as well as those cases of hysterectomy in



which the conserved ovary was retained with its tube, retention of the tube insuring a more perfect ovarian circulation. Where tubes were removed at the first operation, great care had been taken to preserve the afferent and efferent circulation of the ovary by individual ligation of the three tubal branches. Where the uterus was removed at the primary operation, the uterine artery had been ligated at a point below the ovarian anastomosis so that again the ovarian circulation was maintained both ways.

Polak's opinion is that where 73 women have to be re-operated upon for painful and cystic ovaries within five years of the primary procedure, either the judgment or the technique of the surgeon is at fault. He is convinced by this study of his end-results that routine conservation of the ovary, or a part of the ovary, when the uterus has been removed, is not always in the best interests of the patient's future well-being.

He reports five cases by way of illustration and offers the following conclusions:

1. Routine conservation without due consideration of the ovarian and contiguous pathology as it exists in the individual case is not good teaching.
2. Regeneration of the conserved ovary depends largely on the type and duration of the existing infection and the condition of the tunica of the individual ovary.
3. Even when the most detailed technique is observed, the ovarian circulation is impaired.
4. Without the uterus, the retained ovary is always a focus for possible trouble.
5. The life of the retained ovary is of short duration, and the trophic influence of the diseased ovary has been overestimated.
6. A cured patient has fewer nervous symptoms.

CAREY CULBERTSON.

#### EXTERNAL GENITALIA

**Abbott, A. W.: Artificial Vagina Utilizing a Single Portion of Ileum.** *Surg., Gynec. & Obst.*, 1918, xxvii, 227.

All reported cases to date in which the bowel is used to line the new vagina have followed the Baldwin method of utilizing a loop of the ileum, except one case reported by Wallace in 1911, in which he made use of a single limb of the sigmoid. As the diameter of the ileum is abundant and as one side of a loop is as long as the loop itself, the author made use of this method in the case cited. The technique followed that of Baldwin in most respects, the difference being that the author used a vertical incision

through the vulva and a single limb of the ileum instead of the loop.

The advantages of using one limb of the intestinal loop instead of both are: (1) it takes less of the bowel; (2) it requires the closure of only one end of the utilized limb, instead of both ends of the loop; and (3) a second operation to divide the septum between the legs of the loop is unnecessary. The operation is complete in one sitting.

#### MISCELLANEOUS

**Sperry, J. A.: Results Following Operative Treatment of Pelvic Inflammatory Disease in the Stanford University Clinic.** *Calif. St. J. Med.*, 1918, xvi, 388.

The records in the Stanford Women's Clinic show 105 cases of pelvic inflammatory disease operated upon. There were two deaths in this series; one followed hysterectomy for chronic pelvic inflammatory disease. She died from pneumonia on the third day. The other followed left salpingo-oophorectomy and curettage. Diagnosis was left tubo-ovarian abscess with chronic appendicitis. The patient died from general peritonitis on the second day following operation.

The results, so far as backache is concerned, remain about the same, no matter what type of operation was done, showing an average of about 35 per cent of cures. About one-half of the cases remained the same or were made worse.

A great number of backaches encountered in pelvic inflammatory lesions are not due to pelvic inflammatory trouble, but to some other factor, and all the other possible causes should be investigated carefully before operation.

On the other hand, abdominal pain was cured in all the hysterectomy cases accompanied by the removal of both adnexæ. In conservative hysterectomy 60 per cent were cured or improved, 20 per cent were unimproved, and 20 per cent were made worse.

In the conservative operations, 5.8 per cent were cured of nervousness, 17 per cent improved, 40 per cent were unimproved, and 34 per cent made worse. In hysterectomy with double oophorectomy, or in which one or both ovaries were left, 14.2 per cent were cured, 42.6 per cent improved and 42.6 per cent were made worse.

In the conservative operation, the general health was improved in 60 per cent, it remained the same in 25 per cent, and was worse in 11 per cent. After hysterectomy, it improved in 87 per cent and was worse in 12.5 per cent.

EDWARD L. CORNELL.

# OBSTETRICS

## PREGNANCY AND ITS COMPLICATIONS

**Balard, P.: The Permanent Hypotensive Action of Blood-Letting in Eclampsia** (De l'action hypotensive durable de la saignée dans l'éclampsie gravidique). *Compt. rend. Soc. de biol., Par.*, 1918, lxxx, 787.

French obstetrical practice has always utilized blood-letting as a heroic method of treating eclampsia. In studying the evolution of oscillometric values in obstetrics, variations have been noted following blood-letting in the course of eclampsia and the severe albuminurias of pregnancy.

The author gives a tabular statement of 9 of the most complete of these observations. These show that blood-letting in eclampsia causes an immediate and lasting fall in the maximum and minimum oscillometric values. The amount of the fall does not depend on the quantity of blood withdrawn. In the cases which the author reports, the immediate fall in pressure was regularly continued during the days following. The immediate reduction of tension shows the diminution of the work of the heart.

Contrary to older ideas, blood withdrawals of a medium grade, 500 grams, suffice in eclampsia to cause an immediate and lasting fall of the arterial pressure in elevated hypertension of the renal type, as well as a diminution of the work of the cardiac muscle.

This permanent hypotensive action fully justifies the confidence which obstetricians have always placed in blood-letting as a treatment of eclampsia.

W. A. BRENNAN.

**White, C.: Nephrotomy Combined with Cæsarean Section in the Treatment of Eclampsia with Suppression of Urine.** *Brit. M. J.*, 1918, ii, 4.

The indications for cæsarean section are the occurrence of convulsions or the onset of severe toxæmic symptoms in a primigravida with an undilated cervix, especially if little urine is being secreted and if generalized œdema and cyanosis are present. The advantage of cæsarean section in such cases is that no rapid method of delivery per vaginam is possible except at the cost of local trauma and shock that exceeds that of laparotomy. After cæsarean section the eclamptic seizures rapidly improve in the great majority of cases, but in some there is difficulty in eliminating the toxin owing to more or less marked suppression of urine.

To ascertain the state of the kidney during an eclamptic attack in patients with a diminished output of urine, the author has palpated the kidney directly through the abdominal incision after performing cæsarean section in eclamptic patients. In every case he has found the organ swollen, tense, and in some cases, as hard as stone. Whatever the

pathology of the condition, increased intracapsular pressure certainly has been present in the cases in question, and this is a very important factor in causing suppression of urine; it may be the only factor of vital importance in some cases of acute inflammation of a previously healthy kidney. If increased pressure inside the fibrous capsule of the kidney be the cause of the suppression, it may act through alterations in the blood flow or by pressure on the tubules leading toward the ureter. Of the two, the latter seems to be the more probable mode of action.

If increased intracapsular tension be the cause of the diminished flow of urine, and if the diminution in the quantity of urine passed is sufficient to cause delay in the excretion of the toxin causing the nephritis, the indication is to relieve the hypertension before degeneration of the renal epithelium takes place and the terminal thrombosis of the intertubular vessels occurs. Cæsarean section for eclampsia is one of the few conditions in which this can be done easily, as at this time the operator is faced with: (1) acute inflammation of a previously healthy kidney, (2) general toxæmia causing that inflammation, and (3) a laparotomy incision giving easy access to the kidney. Since the renal tension is very frequently raised, it has become routine to treat suitable cases by nephrotomy after doing cæsarean section. Such suitable cases are uncommon even in a lying-in hospital, yet the results as regards immediate free diuresis have been good and uniform, as every patient in the author's experience (six in number) has passed a large quantity of urine from the time of operation.

Suppression of urine in some cases of pregnancy toxæmia is caused by pressure on the collecting tubules due to increased tension inside the fibrous capsule of the kidney. It can be treated successfully by nephrotomy after symptoms have persisted for many days. As a prophylactic measure, nephrotomy may be combined with cæsarean section advantageously in suitable cases. EDWARD L. CORNELL.

**Reed, C. B.: The Induction of Labor at Term; a Supplemental Report.** *Surg., Gynec. & Obst.*, 1918, xxvii, 163.

In the present series there were 51 primiparæ and 49 multiparæ. The average duration of labor was 8 hours and 8 minutes. This figure is greater by 53 minutes than the average in the first series, but it may possibly be accounted for by the presence of 16 more primiparæ in this series.

The longest labor was 28 hours; the shortest, one hour. The shortest labor in a primipara was 1 hour and 25 minutes.

The bag broke during or shortly after insertion



three times, but it was re-inserted only once. The membranes were ruptured by the introduction of the bag five times. In one case of hydramnios it was intentional.

There were no maternal deaths.

The average weight of the babes was seven pounds and two ounces, not including two pairs of twins which averaged five pounds and two ounces. Among the babes were 57 boys and 45 girls. Five babies died. Two were bleeders and died on the second and fourth days respectively. A third developed toxæmia on the seventh day and died on the tenth. Two were still-born. One of these was a normal spontaneous delivery and the other instrumental. The head was on the perineum when the heart tones grew weak. The forceps were quickly applied in vain.

The positions were: left occipito-anterior, in 58 cases, right occipito-anterior in 16, right occipito-posterior in 21, breech in 16, making a total of 102 (two pairs of twins).

Forceps were used 16 times: to hasten labor 3 times, for deep transverse arrest 7, for uterine inertia 4, for occipitoposterior presentation, 2 times; version and extraction was done twice, once to expedite labor in a heart case and once for prolapsed cord.

The average time for the expulsion of the bag was 3 hours and 19 minutes, as compared with 3 hours and 20 minutes in the previous series. The longest detention of the bag in the cervix was 9 hours, the shortest 10 minutes.

Pituitrin was used in 41 cases. Episeotomy was done 10 times. Tears of second degree or less occurred 12 times. Rigid os, that *bête noire* of obstetrics, occurred three times and the labors lasted 28¼, 18½ and 18¾ hours respectively in these cases. All were primiparæ.

In all cases but two, weights were applied after the introduction of the bag, the traction being just sufficient to keep up a mild pressure on the cervix.

In no instance was it necessary to dilate the os before inserting the bag.

Five cases required a few whiffs of chloroform during the introduction of the bag to control nervousness rather than actual pain.

Involution was normal in all cases.

EDWARD L. CORNELL.

### LABOR AND ITS COMPLICATIONS

**Potts, W. A., Rorke, M., Brydone, J. M., and Others: Report of the Committee Appointed by the Section of Obstetrics and Gynecology to Investigate the Effects of Scopolamine-Morphine Narcosis, Twilight Sleep in Child-birth. *Proc. Roy. Soc. Med.*, 1918, xi, Sect. Obst. & Gynec., 1.**

The committee decided to test the value of scopolamine-morphine narcosis in a series of labors conducted in the wards of hospitals to which they were attached, and to ascertain how far the results demanded by Gauss were obtained.

It was agreed that a standard solution of scopolamine should be employed, but the initial dose should consist of ¼ gr. of morphia and 1/150 gr. of scopolamine and that subsequent doses should consist of 1/450 gr. of scopolamine. The patient was to be isolated during the labor and, as far as possible, precautions were to be taken to avoid sensory impulses.

The observations were carried out independently in four hospitals: Queen Charlotte's Lying-In Hospital, General Lying-In Hospital, York Road, St. Bartholomew's Hospital, and St. Thomas' Hospital.

The administration of scopolamine and morphia at Queen Charlotte's Hospital to 67 patients gave good results. In 90 per cent the pains of labor were diminished. Complete amnesia was obtained in 46.2 per cent and partial in 44.7 per cent. Analgesia was complete in 32 cases, partial in 31. There were two failures. The memory test could not be relied on. No active delirium was observed, and labor did not seem to have been prolonged after giving the first injection.

There were 12 forceps deliveries, but the indications were due to obstetric complications, such as occipitoposterior positions or large head, and not due to the effects of the drugs on uterine contractions. The placenta was spontaneously expelled in 65 out of the 67 cases, this being evidence that uterine contraction and retraction were not interfered with.

In 53 out of 68 babies (one case of twins), breathing or crying was noted as spontaneous. In 13 cases the baby was described as blue, but in one instance only was there cause for alarm. Most of the blue babies at birth were limp, but soon recovered. Hot baths and artificial respiration were only required in the minority of cases. Violent resuscitative methods for such babies are to be deprecated. Three babies died, two were premature, and one died of bronchopneumonia on the sixth day. There were three cases of white asphyxia with forceps deliveries, due to delay from obstetric complications and not to the drugs used.

Of the 20 cases reported from the General Lying-In Hospital, 19 were primiparæ and one secundipara. Except for one which developed eclampsia and one brow presentation, all were cases of normal labor. The number of injections varied from 1 to 17, the average being 6.8; in the primiparæ only 7. The memory test was not of much assistance. Ten per cent of the cases were failures; in 90 per cent some relief was obtained and in 50 per cent complete amnesia and analgesia. No great effect was noticed on the mother. Diminution in the strength and frequency of the pains following the first injection was observed, but later in the narcosis the rhythm usually returned to its previous character and the labor proceeded naturally. In one case uterine inertia occurred and the injections were postponed for that reason.

Delay in the second stage was very marked, there

being five instrumental deliveries. One of these, however, was in a case of eclampsia, leaving four of low forceps delivery due to delay at the outlet, i.e., in 20 per cent of the cases, a very high percentage for the hospital. There were no stillbirths, but one infant restored after artificial respiration for twenty minutes died seven hours later. One required artificial respiration, off and on, for two hours before natural breathing was fully established; five were blue and did not breathe at once but were easily restored, though one of them had an alarming attack of cyanosis on the second day.

From St. Bartholomew's Hospital 20 cases were reported. The smallest number of injections given was three, the largest 14, and the average 6.2. One hour after the administration of the initial dose 1/450 gr. of scopolamine was given and twenty minutes later an object with which the patient was not familiar was shown to her. The memory test is a safe guide, but not an absolutely reliable one, for there are instances in which apperception is present throughout, but amnesia is complete. The pains of the first stage were apparently unaffected in 13, became stronger in 3, and weaker and less frequent in 4. It is worthy of note that out of the four patients in whom the pains became weaker, three were multiparæ. In the absence of uterine inertia, little effect was produced upon the strength, frequency, or duration of contractions in stage one.

The second stage was distinctly prolonged, especially among the primiparæ. This was due to the lack of voluntary expulsive efforts on the part of the patient, but in three patients there was also a weakening of the uterine contractions. When neither mother nor child showed signs of distress, the second stage was allowed to continue for five or six hours, but, in spite of this, eight out of the fourteen primiparæ failed to deliver themselves spontaneously; seven children were extracted by forceps and one by traction on the breech. Of the six multiparæ, five were delivered spontaneously and one by forceps. The average duration of the second stage in the primiparæ was four and a half hours. In the multiparæ it was one hour and thirty-five minutes.

The third stage of labor was prolonged, the average duration being fifty-five minutes. There was no severe postpartum hæmorrhage during the third stage. There was a temporary relaxation of the uterus four or five hours after delivery in three cases. In 25 per cent there was no amnesia and the whole course of the labor was clearly remembered.

Most "twilight sleep" babies were born in a condition of oligopnœa and, although it appears alarming, the condition is transient and need not cause anxiety. No special treatment is required beyond covering up the child and keeping it warm. In three cases, and these were all forceps deliveries, there was a condition of true white asphyxia; the child was deathly white, its muscles flaccid, the reflexes absent, and the heart acting feebly. Under the treatment described all these children recovered.

The puerperium and period of recovery was not affected adversely by the injections. In the majority of cases the pangs of childbirth were materially lessened and in more than half the cases the memory of the greater part of the labor was completely obliterated. The duration of labor was lengthened and the proportion of instrumental deliveries increased. No serious adverse effects were produced upon the mother excepting that there was some tendency to relaxation of the uterus after delivery, but not sufficient to cause anxiety in any case.

In St. Thomas' Hospital 80 cases were specially observed; 60 were primiparæ and 20 multiparæ. The number of injections varied from 1 to 19, the average being 6.5. In the primiparæ the average was 7.2, in the multiparæ 5.5. The "memory test" proved quite useless. The notice the patient took of the prick of the hypodermic needle was found to be more useful than the memory test. It was found that the injection due two or three hours after the first could often be omitted. Five per cent of the cases may be reckoned as complete failures. In 95 per cent some relief from the pangs of labor was obtained, in 77.5 per cent some degree of amnesia and analgesia was present, and in 45 per cent complete amnesia and analgesia.

There seemed to be a tendency to delay in the latter part of the second stage and this was shown by an increase in the number of forceps deliveries. Pituitary extract was also given in eleven cases before the birth of the child, the rule being that if delivery did not follow its administration within half an hour, extraction by forceps should be carried out at once. Of these eleven cases delivery resulted within a short interval in five. In the other six cases, two of which were unreduced occipitoposterior positions, delivery by forceps followed, and in four other cases delivery by forceps was done without any preliminary injection of pituitary extract. There were thus ten cases of delivery by forceps, or 12.5 per cent, which is about four times the average in the ward of cases in which this operation is done for delayed second stage.

The placenta was expelled spontaneously by the patient's own efforts in 41 cases and was expressed after expulsion from the uterus in 39 cases. Bleeding was stated to be greater than usual in 9 cases. In four the bleeding was described as postpartum hæmorrhage. Three stillbirths, or 3.75 per cent, occurred, two of which were due to causes quite independent of the narcotism. In 19 cases (23.75 per cent) the child did not breathe nor cry spontaneously at birth, but in nine of these the delay was so trifling as to be scarcely worthy of notice. There were ten cases of instrumental delivery,—one multipara, nine primiparæ.

The principal disadvantages attending this form of narcosis are those which may be expected from any form of anæsthesia,—the prolongation of labor, the tendency to delayed retraction in the third stage and to sluggishness of the infant in starting respiration. These effects can be judged from the evidence



given, but they are not serious, and beyond occasional attacks of cyanosis in the infant immediately afterward, no ill-effects on mother and child were noticed during the lying-in period.

In 65 cases at the City of London Lying-In Hospital complete amnesia was produced in 43 per cent of the series, partial amnesia in 52 per cent, and complete analgesia in 12 per cent, excluding those patients in whom complete amnesia was present. All the patients were primigravidæ. The effect on the pains was difficult to estimate, but in 34 per cent the pains appeared subnormal. The interval between the pains in all cases was normal. Bearing-down efforts were, as a rule, subnormal.

Labor lasted from six hours and forty minutes to one hundred hours and fifty minutes, the average being twenty-four and a half hours for the first stage and two and a half hours for the second stage. This shows a prolongation of the second stage of labor fifty minutes in excess of the normal for this hospital (one hour, forty minutes). Forceps were applied in 32 per cent of the cases. In all of these the application was necessary. This is greatly in excess of the average percentage of forceps delivery in this hospital, which is 11.8 per cent in primigravidæ.

Perineal tears were produced apart from the use of forceps in 14 per cent. The percentage of occipitoposterior positions which did not undergo spontaneous rotation was 39 per cent, or seven out of eighteen.

On the whole, the condition of the baby when born differed slightly from the normal. In some cases, particularly those in which chloroform was given, a disinclination to breathe was present. This was associated with cyanosis and general limpness. Three of the children were stillborn. In one of these pregnancy was only 32 weeks advanced. In the other two labor lasted for one hundred and one hours, and seventy-two hours respectively.

EDWARD L. CORNELL.

## MISCELLANEOUS

**Knickerbocker, F. H.:** A Brief Summary of 1,000 Consecutive Cases of Confinements. *Minnesota Med.*, 1918, i, 303.

Of 980 women of whom the item was noted, 309 were primiparæ. Of the 1,000 women, 4 died, one of nephritis and eclampsia, one from peritonitis, one who was found dying from placenta prævia, and one from confluent smallpox.

Of the last 500 cases none died. Two women had measles at the time of labor. There were six cases of eclampsia. All of these recovered except one.

There were 1,010 babies, eight pairs of twins, and a case of triplets. There were 21 breech cases, 5 of which were born dead. There were three footlings, three face positions, two cross presentations, and one shoulder.

The forceps were used 22 times, in 3 cases on account of eclampsia. In the last 500 cases the forceps were used 8 times. Besides the five breech cases, two forceps cases and one face, there were eight stillborn babies.

There were two cases of spina bifida, one of double harelip and cleft palate, one of congenital cataract, and one with six fingers and six toes.

Of the last 500 children, the average weight was 7.94 pounds. Of these same 500, 264 were born between 6 p. m. and 6 a. m., and 236 from 6 a. m. to 6 p. m.

He says: "It is the tedious excessive pain of the first stage that wears the patient out. The first stage of labor can be greatly shortened and made easier by the proper use of chloroform. It is of no account unless enough is used, and the patient will not co-operate if too much is used." He attributes the shorter time spent in the last 500 cases, the infrequent use of forceps, and the better condition of women after labor, only to the use of chloroform as described in the report.

# GENITO-URINARY SURGERY

## KIDNEY AND URETER

**Gayet: Projectiles Embedded in Kidney Tissue; Urinary Fistula; Nephrectomy and Recovery** (Projectiles intra-rénaux; fistule urinaire; néphrectomie; guérison). *Lyon méd.*, 1918, cxxvii, 311.

It is rare for a projectile to remain in the soft kidney tissues. There is no resistance offered to the passage of the projectile and hence perforations, fissures or ruptures of the organ are more usually met with as the result of war traumatism. The author relates a case in a soldier who was wounded in the left lumbar region by shell fragments. After the preliminary treatments three lumbar fistulae persisted. Radiographs showed three pieces of projectile in the inferior and superior ilio-lumbar regions. Urine was noted escaping through one fistula.

Under screen control after a vertical paravertebral incision the largest piece of projectile was extracted; further radioscopy showed that the smaller projectiles were intrarenal; one projectile was in the capsule and the other in the extremity of the superior calix. They were extracted by splitting the kidney. The further developments of the case necessitated a nephrectomy some months after the extraction of the projectiles from the left kidney. The man made an excellent recovery.

The reason for the failure of the extraction operation in this case was the fact that there was a third particle of projectile in the kidney which the radioscopy screen examination did not reveal at the time of extraction of the others.

The author calls attention to the rapid alterations which the kidney showed following the presence of these foreign bodies, shown physiologically by the fall in urinary functional results, and anatomically by sclerosis and small miliary abscesses. These changes show the necessity for a rapid intervention in cases of intrarenal projectiles since they have a most pernicious action on the neighboring parenchyma somewhat analogous to but more rapid than that due to kidney calculi.

W. A. BRENNAN.

**Marmol, D. G.: Malignant Hypernephroma of the Kidney; Successive Metastases in the Humerus and Femur** (Hipernefoma maligno del riñon; metastasis sucesivas en el humero y femur). *Rev. de med. y ciruj.*, Habana, 1918, xxiii, 128.

The patient was a man fifty years old who was operated upon for a renal tumor. The lumbar nephrectomy incision was used but was made 10 cm. long owing to the size of the tumor. The post-operative course was satisfactory, the patient leaving the hospital after a few weeks. The tumor weighed 420 gr. It was 23 cm. long and 15 cm. thick

at its superior pole. Histologic examination showed it to be a typical malignant hypernephroma.

Six months later the patient returned to the hospital complaining of acute pains in the left shoulder-joint, which was swollen and very sensitive to pressure. These pains began about two months after operation. A very careful examination showed all the symptoms of osteosarcoma and the patient consented to a radical operation. An interscapulo-thoracic amputation therefore was done. Sarcomatous invasion had destroyed the capsule and invaded the joint.

The patient passed one and a half years in excellent health. He then suffered a bad fall which fractured the lower third of the femur, and he came to the hospital for treatment. After two months pseudarthrosis developed, with a very disproportionate exuberance of callus. The symptoms were ultimately diagnosed as sarcomatous development at the site of fracture. The thigh was amputated at its upper third. The man survived the operation for two years, then showed new metastases and died.

The author thinks the theory that these hypernephromata are of sarcomatous origin is reasonable, inasmuch as they are disseminated by the venous route and not by the lymphatics. Metastases are most usually observed in the lungs, the liver, and large bones.

W. A. BRENNAN.

**Geraghty, J. T., and Frontz, W. A.: A Study of Primary Hydronephrosis.** *J. Urol.*, 1918, ii, 161.

The authors state that the object of this study was to determine the factors responsible for the development of the so-called "primary" condition.

They do not wish it to be understood that vascular anomalies are never the primary cause of hydronephrosis, but they are of the opinion that to assign to the anomalous vessel the chief credit for the production of the obstruction is, in the majority of cases, merely the confusion of cause and effect, for in exposing kidneys which are the seat of other diseases, they have frequently seen vessels occupying positions identical with those described as productive of obstruction, without having occasioned suggestive symptoms or altered the size of the pelvis.

In those cases of renal mobility giving a history of repeated attacks of colic which they were able to observe, there has never been a definite hydronephrosis except in those instances in which other factors, co-existing and definitely obstructive, would offer a valid explanation. If renal mobility can produce hydronephrosis, the kinking of the ureter must be assigned as the cause, and it has been shown experimentally that a very acute permanent kink can be produced by suturing the walls of the ureter, without producing any change in the renal pelvis.



The reason movable kidney is assigned as so frequent a cause of hydronephrosis is due to the fact that renal mobility is frequently secondary to hydronephrosis; and secondly, to a failure to recognise other more potent although less evident causes of obstruction, occurring either coincidentally with movable kidney or long preceding it in point of time.

The authors state that congenital abnormalities, whether they occur in the ureter or elsewhere, are frequently associated with other defects; and they believe that when hydronephrosis exists in a kidney with multiple ureters, the hydronephrosis cannot be explained on the basis of ureteral multiplicity but that it has been produced by other concomitant defects which actually produce an obstruction to the outflow of urine; of these, abnormalities in ureteral caliber are probably the most important.

In 8 cases of hydronephrosis in which the authors considered it advisable to do a nephrectomy rather than any plastic procedure, a pathological study of the ureteropelvic junction disclosed that in all the cases examined, excepting one, the hydronephrosis was evidently the result of inflammatory narrowing, the true nature of the obstruction being revealed by careful microscopic study of this region. In 2 cases there was a marked increase of connective tissue just beneath the mucosa and only after a very careful examination were a few areas of round-celled infiltration found, thus proving its inflammatory origin.

They say that it is well known that a contraction in the lower portion of the ureter may cause very slight, if any, hydronephrosis, whereas if this same degree of contraction be present at the ureteropelvic junction, a marked and rapidly developing hydronephrosis would result.

The authors claim that diagnosis is comparatively easy, yet a demonstration of the causative factor may offer considerable difficulty and in a certain number of cases it must be made by elimination. In certain instances a definite narrowing of the upper ureter may be demonstrated by ureteropyelography, and in cases where an aberrant blood-vessel plays a rôle in the obstruction, a kink in the upper ureter may be found. In other cases, calculus, tuberculosis, and tumor must be eliminated. They emphasize the fact that narrowings occurring at the ureteropelvic junction are usually secondary to inflammatory processes. Hunner's method facilitates the recognition of a certain number of cases in the female, particularly in which there is a considerable area of scar, while in the male in many cases it is not successful. The application of the wax bulb method in the male is of slight aid.

In the vast majority of cases the process is so far advanced and the obstruction of such long standing that attempts at dilatation seem hardly warranted. The determination of the presence or absence of infection in the urine from each side, together with the functional value of each kidney, is of great aid in the selection of the proper operative

treatment. If a bilateral hydronephrosis be present, with a reduction in the total functional capacity of the kidneys, procedures designed to correct the obstruction are infinitely preferable to nephrectomy. In other cases in which the hydronephrosis is slight, but apparently progressive, and in which the condition is not complicated with infection, the conservative plastic operation is the method of choice; on the other hand, a marked grade of infected hydronephrosis with full compensation established in the opposite kidney would call for nephrectomy.

If the narrowing does not involve the ureteral wall deeply, the authors have successfully employed the Heineke-Miculicz principle, converting the long axis, formerly vertical, to one more or less horizontal. In cases in which the stricture involves the upper ureter for a distance exceeding 1 cm., the Heineke-Miculicz principle is not applicable; they either amputate the ureter below the stricture and anastomose the free end into the renal pelvis, or they follow a method that recalls the pyloroplasty of Finney.

In their conclusions, Geraghty and Frontz say that the most frequent cause is an inflammatory contraction at the ureteropelvic junction, and a careful microscopic study will disclose this lesion in a large percentage of cases. In many cases in which aberrant blood-vessels, renal mobility, or abnormal implantation of the ureter have been assigned as the cause of the hydronephrosis, careful examination of the upper ureter and pelvis will reveal inflammatory narrowings which have unquestionably played the primary rôle. When the kidney possesses valuable renal function or when a bilateral condition contra-indicates nephrectomy, the various plastic procedures offer considerable prospect of success.

LOUIS GROSS.

**Pirondini, E.: Applications of Experimental Azoturia to Renal Surgery** (Applicazione della azoturoa sperimentale alla chirurgia renale). *Polichin.*, Roma, 1918, xxv, sez. chir., 161.

By experimental azoturia Pirondini means the elimination of urea provoked by the administration of a solution of urea. The amount administered is 10 grains in 150 ccm. of distilled water. The urine is gathered for each of the five to seven half-hour periods following and the contents noted. There is customarily a notable increase in urea elimination in the first half hour; this reaches a maximum in the next period and then successively diminishes. The test of elimination is entirely dependent on the functional condition of the kidney. Hepatic conditions are of almost no importance.

The author has applied this method of testing the kidney function in renal surgery and in important vesical lesions. For instance, in chronic cystitis and pedunculated bladder tumors the kidney function is not altered; but in cases of infiltrating vesical tumors it is known that the kidney function is strongly altered and this factor is dominant in the prognosis of a surgical operation. The value of the

kidney function is therefore of prime importance in deciding upon intervention.

The author finds that experimental azoturia gives results agreeing with those given by the urea secretory constant and the elimination of phenol-sulphonephthalein.

The author discusses the value of his method of experimental azoturia: (a) associated with ureteral catheterization; (b) applied to patients operated upon for renal lesion without ureteral catheterization; (c) applied to the nephrectomized; (d) in case of invasion of the remaining kidney after a nephrectomy, or where there is bilateral invasion; (e) in cases of pregnancy after nephrectomy. The various findings by the method under each of these heads are detailed.

W. A. BRENNAN.

### BLADDER, URETHRA, AND PENIS

**Fullerton, A.: Observations on Bladder Injury in Warfare.** *Brit. J. Surg.*, 1918, vi, 24.

Fullerton calls attention to the comparative rarity of injuries to the bladder in warfare, the percentage of total wounds reaching the base being not more than 1 in 3,000 or 4,000. His paper is based on a study of 53 cases. A few of these cases were seen at clearing stations, but the paper deals with the subject from the point of view of a surgeon working at the base.

In his review of the anatomy he calls attention to the fact that the bladder in a collapsed state is strictly a pelvic organ, and occupies so little space that it forms a very small target for the missiles of war. It is reasonable to suppose that just before an attack the state of nervous tension practically always present will lead to an evacuation of the bladder contents; whereas if the patient is caught unawares at other times, the organ may be in a state of distention. The prostate because of its proximity to the neck of the bladder is frequently injured with it.

In the 53 cases reported, the injury to the bladder was caused by bayonet in 2 cases; by shell in 24 cases; by bullet (rifle or machine-gun) in 12; in 7 by shrapnel; in 1 case indirectly by a shell and directly by a fall of earth on the abdomen; in 7 cases the nature of the missile was unknown.

In about two-thirds of the cases the missile reached the bladder by way of the buttock. In 5 others there was an exit wound in the region of the buttock, communicating with the bladder. In nearly 75 per cent, therefore, there was a wound in the buttock region reaching as far as, or actually penetrating, the bladder. The suprapubic route was comparatively rare. Wounds which shatter the symphysis pubis and lay open the bladder rarely reach a base hospital. Entrance wounds in the buttocks, suprapubic, sacral, or coccygeal regions, or in the thigh or groin, should be carefully investigated. If a wound of exit is present, reconstruction of the track by sectional anatomy may indicate whether it is likely to have involved the bladder or not.

The foreign body was retained in 33 cases. In 10 it came to rest in the bladder. In the remaining cases it lodged in the pelvis or its walls, occasionally between the bladder and rectum. In one case it lodged just outside the bladder wall, while in another it was found later by cystoscopy to be embedded in the wall, in process of ulcerating its way through.

The entrance wound is frequently of small size and comparatively insignificant on superficial examination. The wound in the bladder itself was of the most varied nature. Sometimes it was a perforation, sometimes a tear or a slit, and in one case a considerable portion of the bladder wall had been shot away.

The gravity of bladder injuries is greatly enhanced by associated damage to adjacent structures such as intestine or bone. Shock is likely to be present when other severe injuries complicate the case. According to Wallace, it is one of the chief causes of death at the clearing stations.

Hæmorrhage also contributes largely to the high mortality of wounds of the bladder at the front. Leakage of urine is one of the most important accompaniments of injury to the organ. This may appear at the wound in the parietes, or be more or less concealed in the form of extravasation into cellular tissue or leakage into the peritoneal cavity. In cases reaching the base, a urinary fistula was most frequent in the region of the buttock. When the rectum was also injured, a rectovesical fistula usually resulted, and urine either escaped into the bowel or was discharged, often accompanied by feces, from a wound in the parietes. Retention of urine is quite a common symptom following injury to the bladder. If the wound is small, distention may occur and require the use of the catheter. This applies, of course, to those cases in which suprapubic cystostomy has not been performed.

A sudden, sharp pain may occur when the bladder is struck, but when the patient reaches the base, pain referred to the bladder is not a constant feature. There is some tenderness and rigidity in the hypogastrium in a fair proportion of the cases. Vomiting is occasionally seen in cases of bladder injury in which the peritoneal coat is intact. On the other hand, it may be entirely absent in the first hours of an intraperitoneal lesion. As in most war wounds, fever is commonly present, and depends largely upon the amount of infection in the soft parts and bone. When it persists, pelvic cellulitis, abscess formation, osteomyelitis, or spread of infection to the kidney should be suspected.

In examining a case of suspected injury to the bladder, attention should be paid to the position and direction of the wounds, and to the accurate localization of foreign bodies, if present. Radiography is of value in this respect. Cystoscopy will discover a missile or bone fragment in the cavity of the bladder, or a lesion of its wall. Rectal examination will give valuable information as regards wounds



of the lower bowel, fluid accumulations in the pelvic connective tissue, and palpable foreign bodies. Hæmaturia should raise strong suspicions of bladder injury, but it must be borne in mind that cases of hæmorrhagic cystitis have been comparatively frequent during the present war. Routine cystoscopic examination is not possible in war time, although the author was able to carry it out in 11 cases, representing several types of injury.

The complications are pelvic cellulitis, peritonitis, extravasation of urine, cystitis, epididymitis, kidney infection, osteomyelitis and necrosis, involvement of the hip-joint, secondary hæmorrhage, fæcal or rectovesical fistulæ, fæcal extravasation, lung complications and intestinal obstruction.

The mortality in bladder wounds is rather high. Wallace states that in uncomplicated cases it is 56 per cent, and in complicated cases the picture is dismal in the extreme. In the author's series of 53 cases, the mortality was over 24 per cent.

The indications for treatment are as follows:

1. All foreign bodies, including missiles, fragments of bone, pieces of clothing, and blood-clot, should be removed from the bladder as soon as possible. This may be done by way of the original wound, by washing out through the urethra, or by cystotomy. If the latter is performed, the opening in the bladder may be closed by suture in suitable cases.

2. The wound in the bladder, if accessible, whether it be intraperitoneal or extraperitoneal, should be closed if possible.

3. After operation, care must be taken to keep the interior of the bladder clean by frequent and thorough irrigation until the urine is clear.

4. Careful attention should be paid to the perivesical and perirectal cellular tissue, to prevent, if possible, extravasation, accumulation, and the spread of pelvic cellulitis.

5. The wound in the parietes should be dealt with as thoroughly as the anatomical peculiarities of the affected region permit.

The author gives a brief résumé of the 53 cases reported, including results of postmortem examination in the fatal cases, and the subsequent course in the cases that recovered. He feels that the later results of injuries of the bladder are disappointing in the extreme, and it is only by constant, prolonged, and skilled after-treatment, in special hospitals if possible, that one can hope for any definite improvement.

As a result of his study of these cases the author draws the following conclusions:

1. Injuries of the bladder form a very small proportion of the total wounds reaching the base hospitals.

2. Their importance from the point of view of prognosis and treatment depends to a large extent upon associated injuries.

3. The more usual associated injuries are those of the bones of the pelvic girdle and of other pelvic viscera. The most frequent viscus found injured in cases reaching the base is the rectum.

Injuries of the pelvic colon and small intestine are comparatively rare in cases seen at the base.

4. The importance of the perivesical connective tissue cannot be overestimated. This forms a potential, continuous space extending from the cavum retzii in front, around the sides of the bladder and rectum, to the posterior part of the latter behind. Pelvic cellulitis is a frequent complication.

5. The mortality of bladder injuries is very high. In cases reaching the base it may be estimated at 30 per cent. The chief causes of death have been pelvic cellulitis, peritonitis, and sepsis.

6. The chief sequelæ, judged from the reports coming from England up to the present, are necrosis of bone, persistence of cystitis, calculus, and stricture at the neck of the bladder. Sufficient data are not at present available to enable the author to judge of the frequency of extension of infection to the kidney.

7. The treatment should be conducted on common-sense lines. Accumulations of infected fluid, blood-clot, and fæcal material in the pelvic connective tissue must if possible be prevented by attention to the original wounds. If this is unsuccessful, suitably planned incisions should be made. The fact that urine flows over the surface of a wound is not necessarily in itself an indication for suprapubic cystostomy. If the bladder can be kept clean by irrigation, aseptic urine from the kidneys does not appear to have a deleterious effect on the wound.

8. Suprapubic cystostomy will drain an infected bladder, but will not prevent pelvic cellulitis and sepsis from occurring in the perivesical connective tissue and parietes respectively. The after-treatment of the bladder by frequent irrigation is necessary to get rid of cystitis and prevent calculus formation.

G. W. HOCHREIN.

## MISCELLANEOUS

**Walker, J. W. T.: A Review of Recent Work on Urinary Surgery.** *Practitioner*, Lond., 1918, ci, 23.

This article is a review of recent work on urinary surgery. Neisuraca published the results of an experimental research into the lesions caused by suturing the kidney. Permanent changes were found around the suture points in the parenchyma resulting in a gradual disappearance of specific glandular elements and their replacement by scar tissue. He concludes that suturing through the renal parenchyma is generally exempt from important complications and does not compromise the general functional power of the organ.

From the work of Eisendrath and Schultz on the route of infection which takes place in an ascending direction along the interstitial lymphatics of the ureter, the following conclusions are drawn: Infection of the bladder or lower ureter may reach the renal pelvis of the kidney, either by way of the lumen of the urinary tract or by way of the normal lymphatics. Experiments and clinical evidence

indicate that almost complete obstruction to the free passage of urine is necessary for ascent of infection by way of the lumen of the urinary tract. Experimentally, the authors claim to have shown that infection set up by the simple introduction of bacteria into the bladder, without injury or obstruction, may pass upward by means of the interstitial lymphatics of the ureter. The experimental evidence indicates that, in cases of pyelitis and pyelonephritis in the human body secondary to infection of the bladder, the lymphatics constitute the most important course of the upward travel of infection, especially in those cases where there is no hindrance to the urinary flow.

Smith reviews the subject of pyelitis of infancy. In uncomplicated cases the pelvis alone is involved, the lesion being a low grade inflammation. Many cases show in addition degenerative changes in the renal substance due to extension of the process from the pelvis. In regard to the mode of infection, Smith holds that the theory of ascending infection so far as it applies to the pyelitis of infancy has not been proved. The intestinal tract is the source of infection in the majority of cases.

Crabtree and Cabot, in discussing immunity in colon bacillus pyelonephritis and its relationship to prostatectomy, believe that prostatics operated upon within three or four weeks after a pyelonephritis are better operative risks, owing largely to acquired immunity. The prostatic with uninfected urine who undergoes some form of drainage preliminary to operation almost without exception shows some rise of temperature during the period of drainage, often presenting symptoms of acute pyelonephritis. The authors try to eliminate the danger of renal infection by administering mixed colon vaccines during the period of preliminary treatment.

Mayo reports a series of 450 patients operated upon for renal stone, with a mortality of 0.65 per cent. In 9.9 per cent of cases the stones were found in both kidneys. In half of the bilateral cases the second kidney was removed. One of the most common causes of recurrence of stone has been due to attempts to conserve a badly damaged kidney, and another cause is leaving fragments behind in attempting to remove the stone through too small an incision; a third cause is leaving stones that were not shown by the X-ray.

The percentage of recurrence is under 10 per cent. The operations carried out were pyelotomy in 206 cases, combined pelviolithotomy and nephrotomy in 34 cases, nephrolithotomy in 40 cases, and nephrectomy in 204 cases.

Kretschmer describes his observations on the use of cystography. He was able to show that the internal sphincter causes bladder closure and that the posterior urethra does not form a funnel or neck when the bladder is distended.

Normally the ureterovesical valve is supposed to prevent a reflex or regurgitation of fluid into the ureter and up into the kidney. By this method he

was able to show that regurgitation can and does take place in normal bladders. Various bladder conditions were studied, such as tumors, diverticula, etc.

Thomas reports 27 cases of diverticula of the bladder; he classifies them into congenital and acquired types. The ages of the patients, location of the diverticula, analysis of symptoms as well as the treatment carried out in this series of cases are carefully considered.

Lowsley, after discussing certain obstructions at the vesical orifice, concludes that: obstructive tumors at the vesical orifice, exclusive of adenomatous hypertrophy of the prostate proper, are due in 77 per cent of cases to an hypertrophy of the subcervical group of tubules; in 12 per cent to an hypertrophic change of the musculature of the trigone at the vesical orifice. In 4.5 per cent tumors arising from the subtrigonal group are present, 3.5 per cent of the cases show a fibrous stricture of the vesical orifice, and 2.5 per cent have cystic conditions which cause obstruction.

Randall made a study of 300 autopsies in the adult male, ranging from eighteen to eighty-three years of age, with a view to demonstrating the gross pathological characteristics of median bar formation. From this study the author concludes: (1) age is not a determining factor as to the type of bladder obstruction; (2) the fibrous types of median bars are due to chronic inflammation which is part of a chronic prostatitis; (3) a glandular type exists entirely apart from general prostatic hypertrophy.

Thompson Walker describes his observations on the bladder in gunshot injuries of the spinal cord, based on over 450 cases. The condition of the urinary tract is the most important clinical factor in these cases of spinal injury. Urinary infection may be a contra-indication to operation on the spine, or it may cause death after an operation. It may be fatal when operation has already given promising results, or when, without operation, the case is showing signs of improvement in the nerve lesion. A sequence of two distinct stages was observed in these cases. There is a stage of complete retention beginning at the time of injury, during which the bladder is distended with urine. After a time the urine begins to dribble away, the bladder remaining distended (retention with overflow). The duration of this stage was on an average fifty-five days. A second stage of periodic reflex micturition, or active incontinence, succeeds the first stage, and unless improvement in the spinal lesion takes place, this is the permanent state of the bladder. There is a transition stage between the first and second stages, during which the bladder is still distended or partly distended with urine but active contraction of the bladder wall takes place. The bladder gradually becomes more contracted until the quantity of urine left after micturition is very small or there is none at all. In the fully developed second stage, the bladder is purely a reflex organ.

The sequence of this complete retention, followed



by active incontinence, with an intermediate stage, was observed in all lesions of the cervical, dorsal, and also of the lumbar region of the cord, and occurred even when the lumbar enlargement was destroyed. It developed in more than half of the cases of lesion of the cauda equina. Urinary infection is the most common and most fatal complication in gunshot wounds of the spine, and was the cause of death in practically all fatal cases. The infection was due to the catheter, and occurred in the first few days after the injury. Ascending septic pyelonephritis was the fatal complication in all cases, and was due to intermittent catheterization, permitting the repeated distention of the bladder with infected urine.

The treatment of the urinary tract consisted in provision for the removal of the urine and treatment of the septic complications. Intermittent catheterization was the method usually adopted for removing the urine. The tied-in catheter has been used in some cases, but was unsuitable, because it caused sloughing of the urethra and fistula. The author strongly insisted that suprapubic cystotomy should be done in all cases before any catheter was passed, and therefore before the bladder had been infected and ascending pyelonephritis resulted (prophylactic cystotomy). The object of the suprapubic cystotomy was to give the free drainage of the bladder, and prevent intravesical tension forcing infected urine up the ureters and causing septic pyelonephritis. To be effective it must be carried out before any catheter has been passed. When cystitis was already present, suprapubic cystotomy should still be performed in order to treat the cystitis and to prevent recurrent ascending infection.

An important article by Pedersen on syphilis of the bladder reviews the literature and describes two undoubted and two probable cases of this condition. The forms under which secondary syphilis of the bladder appears are very similar to, and often practically identical with, the non-specific lesions known as simple hyperæmia, simple ulcer and papillary growths. The hyperæmia may be symptomless. The characteristic ulcer is like the specific ulcer on any mucous membrane, situated in an area of œdematous infected mucous membrane, with a gray base and definite prominent firm edges. The ulcers are usually multiple in clusters, rarely disseminated, and often grouped around or adjacent to one or both ureter mouths.

In discussing the surgical treatment of vesical neoplasms, Beer states that all benign cases suitable for cystoscopic high-frequency cauterization can definitely be cured by this method. The following types of cases are unsuitable for this method of

treatment: (1) patients who are intolerant; (2) patients who bleed furiously on every application; (3) patients whose tumors are inaccessible; (4) patients suffering from papillomata of the bladder. These cases, and also all those of extensive benign recurrence should be treated by suprapubic cystotomy and removal by the cautery. A partial cystectomy by means of the cautery is recommended in cases of papilloma which appear clinically benign but do not respond promptly to endovesical high-frequency cauterization. When the growth appears malignant cystoscopically, partial cystectomy or total cystectomy should be performed at once.

Geraghty reviews the treatment of tumors of the bladder at the Brady Urological Institute. He divides the tumors into benign and malignant papillomata, papillary carcinoma, adenocarcinoma, squamous and scirrhous carcinoma. In those classed as malignant papilloma, there are changes in shape, staining properties, and nuclei of the epithelial cells without any evidence of infiltration. Experience has shown that patients die of cancerous metastases when these changes in the papilloma are the only evidence of malignancy. When the malignant papilloma has advanced to a point where infiltration of the bladder wall has occurred, the author uses the term "papillary carcinoma." Cystoscopy and the clinical methods proved of greater service in differentiating between malignant papilloma and papillary carcinoma than histological examination. Fulguration was employed in 53 cases, 12 of which were inoperable carcinomata. In none of the carcinomata did the fulguration make any impression on the tumor.

Thirty-four cases of tumor of the bladder were treated by excision, and of these only four were known to be well and free from recurrences during a period of four years or over. Excision should be used only in cases which would ordinarily be suitable for fulguration, but on account of some complication that treatment has become impossible or very difficult.

Barringer reviews a year's work with radium in the treatment of carcinoma of the bladder and prostate. In carcinoma of the prostate, striking results were obtained both in early and advanced cases. In early cases in which the carcinoma was fairly well confined to the prostate and there was little or no perivesicular infiltration, shrinkage of the carcinoma occurred in all. In the observed cases this reduction was permanent. Ten months was, however, the longest period of time for which any of these had been followed. Very large carcinomata with cachexia were beyond the help of radium.

H. L. KRETSCHMER.

# SURGERY OF THE EYE AND EAR

## EYE

**Burleson, J. H.: A Method of Repair for Corneal Injuries.** *Texas St. J. Med.*, 1918, xiv, 172.

The author proposes a method of conjunctival elevation, circumcorneal in extent, with elevation of the conjunctiva well back over the globe, in all cases of rather extensive injuries of the cornea. The iris is replaced if possible, where there is prolapse of that structure, or excised if deemed necessary. After flushing the conjunctival sac with normal salt solution, a No. 2 ten-day catgut purse-string suture is introduced, and when tied brings the conjunctiva together in such a way as to cover the entire cornea. A pressure bandage is applied. The suture is not removed but is allowed to absorb, which allows the conjunctiva to gradually recede from off the cornea and take its normal position and re-attachment at the corneoscleral margin.

Case reports are given of six instances where this method was used with gratifying results to the author. It is cited that the use of this method in his hands has given a prompt repair of the cornea in all cases. He believes that often an eye may be saved by this method where otherwise its enucleation would be the only other alternative.

J. S. CLARK.

**Langdon, H. M., and Jones, I. H.: The Intimate Relation Between the Ear and the Eye as Shown by the Bárány Tests.** *Arch. Ophthalm.*, 1918, xlvii, 348.

The purpose of this paper is to call the attention of ophthalmologists to the governing power of the ear over eye movements and equilibrium. It is not yet generally recognized that the ocular mechanism is dependent upon the ear stimuli for precision of movement. Steadiness of central fixation is made possible only by normally acting ears. Tonic impulses from the right ear continually tend to draw both eyes to the left and tonic impulses from the left ear continually tend to draw both eyes to the right. This is definitely proven in sudden loss of function in one ear and can be shown experimentally by the application of the galvanic current.

Aside from the production of nystagmus experimentally, the ear in many animals has a decided influence on ocular rotations. Barthels makes the statement that section of the acoustic nerves in rabbits produces complete loss of eye movements and in extremely young children he says it is impossible to produce rotary nystagmus and, although the auditory apparatus is already exerting some influence, the results of ear stimulation are irregular eye movements. Nystagmus of the blind is entirely separate from that produced from the ear occurring

because the blind person is not aware of the position of his eye.

The equilibratory portion of the ear consists of two tiny sacs known as the utricle and saccule and of three semicircular canals; the utricle takes cognizance of movements in a linear direction anteroposteriorly, and the saccule of movements in a lateral direction. The semicircular canals are so constructed as to detect rotary movement of the body in all conceivable planes. Such is the complete control of the ear over the eye motions that a nystagmus of any type and in any direction may be produced by appropriate ear stimulation.

The recognition of the ear as the chief equilibratory organ is so recent that most of the intracranial pathways are still undetermined and the authors express their belief of what these are, based on a study of over 600 clinical cases and a considerable number of operations and autopsies.

No case of eye muscle paresis, paralysis or nystagmus can now be considered as completely studied unless the results of ear stimulation have been noted, and the authors suggest that in muscle paresis ear stimulation by means of electricity might be used therapeutically.

S. S. HOWE.

**Velter, E.: Ocular Disturbances Accompanying Wounds of the Head** (Les troubles oculaires dans les blessures du crâne). *Arch. d'ophth.*, Par., 1918, xxxvi, 17, 91.

Velter's long and finely illustrated article on eye lesions accompanying war injuries of the head is divided into three parts, treating respectively craniofacial wounds, and the early and late ocular symptomatology of penetrating cranial wounds. Histories of a number of war cases in the author's practice are given.

Velter thinks that the complete study of these lesions and of their symptoms belongs to the domain of ophthalmology, yet the general surgeon ought to know how to recognize and treat them when needed, because in the early hours after injury careful attention may prevent irreparable injury later.

The eye may be injured at the same time as the cranium under two conditions: (1) the two wounds may be independent, produced by different projectiles; both eyes may be attacked; (2) the cranium and the eye may be injured by the same projectile, in which case there is a large craniofacial or cranio-orbital wound.

Whether an injury belongs to the first or second group, the following course of treatment should be adopted according as the ocular globe is more or less injured:

1. If there is no visible ocular wound. Ordinarily this is a contusion with iridodialysis, traumatic



mydriasis, etc. There are some contusions which cause lesions of the deep membranes of the eye visible much later. There is no special treatment for this class of case.

2. When the ocular globe is more or less destroyed. Nothing is to be gained by delay, and enucleation, or rather the regularization and extraction of all fragments of the sclerotica as far as the optic nerve should be done. The sparing of the conjunctiva is very often forgotten; but its preservation is essential for early cicatrization and for the ultimate prosthesis. Likewise the ocular muscles ought to be respected as well as their aponeurotic structures.

3. When there is a limited penetrating wound of one or both eyes. The wound may be scleral, sclerocorneal or corneal, and there may be hernia of the iris and injury of the crystalline lens.

The treatment may be limited to the application of an occlusive dressing after sterilization of the eye and lids; but if ophthalmologic treatment is instituted at once, the patient will greatly benefit. This consists of: (a) lavage of the eye and lids after cocaine anæsthesia; (b) use of the electromagnet to be sure that there are no projectile fragments in the eye; (c) resection of the iris hernia and careful reduction of the angles of the coloboma; (d) curettage of the crystalline masses; (e) conjunctival covering of the wound after cauterization of the edges with the galvanocautery; (f) occlusive bandage; (g) injections of cyanide of mercury solutions during the first few days; such injections effectively combat the early infections in eye wounds, and even if there is no other treatment, these injections should always be made at the front; they may prevent the loss of the eyes; (h) extraction of a projectile if it has been radiologically located.

W. A. BRENNAN.

### EAR

**Richardson, C. W.:** *Ear Protectors. Laryngoscope*, 1918, xxviii, 514.

With a view to determining the relative merits of the various ear protectors against concussion deafness, the author has had experiments made on animals, from which he has deduced the following conclusions:

1. Of the four protectors tested (British Tommy, Mallock-Armstrong, Baum, and Wilson Michelson), the British Tommy is the best.

2. Cotton is efficient only when moistened with glycerine or vaseline. It deafens the wearer more than the Tommy.

3. It is recommended that several thousand of the Tommy protectors be purchased and issued to the troops with orders to wear them the same as their gas masks.

4. It is recommended also that cotton saturated with glycerine and vaseline be issued to a certain

number of men, so that the relative merits of the Tommy and vaseline cotton can be determined.

OTTO M. ROTT.

**Wilson, J. G.:** *The Effects of High Explosives on the Ear. J. Am. M. Ass.*, 1918, lxxi, 628.

The author gives the results of his experience with the American Expeditionary Forces in France.

Otologic cases resulting from bursting of a shell are divided into: Group A, in which a piece of shell hits the ear or structures in its immediate vicinity; Group B, in which damage has come from the explosion alone, no fragments striking the ear. This report deals with Group B cases only.

War deafness is common on account of the high explosive shells used. Concussion effects are no longer confined to artillery men alone but to all classes of combatants. The effect of a high explosive on the ear is a great compression, followed by a great decompression, the former probably causing the damage.

Common gross pathologic effects of explosions on the ear are: (1) rupture of the drum-head; (2) hæmorrhage into the middle ear spaces; (3) hæmorrhage into the fundus of the internal meatus at the point where the nerve enters the bony canal. The vestibular apparatus as a rule shows very little change. Lesions (1) and (2) cause a certain loss of hearing, while (3) may give rise to deafness, tinnitus, giddiness, and other symptoms of an inner ear lesion.

In addition to total loss or diminution of hearing, the following nerve symptoms were sometimes associated with these cases: exaggeration of tendon reflexes, tremors, vasomotor disturbances, sweating, lethargy, sleeplessness, headache, and vertigo with disturbance of equilibrium. Narrowing of the field of vision and thermal anæsthesia was also noted in some cases.

Eighteen out of 22 patients seen soon after injury showed lesion of the drum membrane. Three of the remaining 4 had a history of old ear trouble. In addition to deafness, these patients complained of vertigo. Of 18 cases examined for this symptom, 12 showed definite signs of labyrinthine vertigo.

Cases seen some time after injury are divided into three groups: (1) those with nerve deafness; (2) those who have nerve deafness of varying degree; cases in which the patient hears without being conscious of doing so; (3) malingerers.

The author discusses cases belonging to Group 1. The use of vibrating tuning forks, the voice used through resonators, and carefully graduated physical exercises were the means employed to stimulate the auditory mechanism.

The above treatment is considered a success if afterwards the patient hears sufficiently to be able to rejoin his regiment.

J. A. WINTER.

# SURGERY OF THE NOSE, THROAT, AND MOUTH

## NOSE

**Byfield, A. H.: Systemic Manifestations of Chronic Nasal Sinus Infection in Childhood.** *J. Am. M. Ass.*, 1918, lxxi, 511.

The author's conclusions are:

1. Infection of the accessory nasal sinuses is greater than has hitherto been commonly suspected.

2. The possibility of this infection as a source of general bodily involvement deserves more attention. In a series of cases including chronic digestive disturbances, persistent cough, occult temperature, poor general health, asthma, infectious deforming arthritis, and cyclic vomiting, sinusitis has been observed and a definite relationship between the infection and certain metastatic processes has been established.

3. Symptoms, such as chronic purulent nasal discharge (especially in winter), sneezing, headache, depression and irritability suggest the possibility of an infection of this region, provided that other etiologic factors have been excluded.

4. The diagnosis may be made by the roentgen ray, but exploratory puncture or even curetting may be necessary.

5. The treatment should be conservative and expectant, unless the trouble persists and continues to affect unfavorably the health of the patient. In the light of present knowledge, surgery is then indicated.

OTTO M. ROTT.

**White, L. E.: An Operation for Bony Occlusion of the Posterior Nares.** *Laryngoscope*, 1918, xxviii, 571.

The author's method is to cut through the obstruction with a chisel, making a triangular section, then punching out the margin and smoothing with a curette. The posterior end of the septum is then removed by ronguers or curette and after being smoothed off carefully it is covered with the mucosa which had been previously cut and elevated from this portion.

Two cases are reported with excellent results.

OTTO M. ROTT.

## THROAT

**Arrowsmith, H.: The Surgery of Laryngeal Maliganancy.** *Tr. Am. Laryngol. Ass.*, Atlantic City, 1918, May.

From the author's observations of MacKenty's work and his own recent experience modeled very closely thereon, he is inclined to tentatively suggest the adoption of Moure's antecedent tracheotomy, to accustom the lower air passages to the direct impact of air, which may lessen their immediate postoperative irritability and susceptibility; the

tracheal opening should be made high, as Jackson has indicated, because that will not interfere with the later mobilization of the trachea. Otherwise the two-step operation seems to offer no special disadvantage.

This is the ideal field for the employment of oil-ether colonic anæsthesia, as devised by Gwathmey. It makes the whole procedure infinitely easier for both patient and operator. Even if really painless under local anæsthesia, such an ordeal produces an enormous apprehension which cannot but be detrimental to the patient, and the degree of infiltration of the tissues necessary to produce insensitiveness must interfere with their repair. With rectal anæsthesia laryngeal spasm does not occur, bleeding is very much less, there is no tracheobronchial irritation from the directly inspired anæsthetic, which very largely obviates the necessity for subsequent repeated applications of the suction apparatus, in itself an agent of some danger, and there is much less likelihood of postoperative vomiting, most undesirable under these conditions.

The laryngologist for every possible reason is the man who should do laryngeal surgery, both external and internal. If he saw all these patients at an early date, thyrotomy would more often be performed.

Laryngectomy cannot be repudiated on any such grounds as the mutilation or the loss of voice. Laryngectomized patients are in no worse case than the blind, the deaf, or the helplessly crippled. Many of them seem to get a fair amount of happiness out of the mere fact of existence, and are not by any means incapable of self-support. In judiciously chosen cases this operation offers a good deal more than a probability of clinical cure, and in most instances a definite retardation of the fatal ending.

Of two cases operated upon by the author, one died six weeks later of pneumonia. The other is in good condition, now six months after operation, and is at work.

In a third case, in whom only a tracheotomy was done, the final sufferings were so great that the author regrets that he did not give the patient "a fighting chance by as far-reaching a dissection as possible," rather than witness such suffering as this man endured during the last six months of his life.

OTTO M. ROTT.

**Rush, C. C.: Retropharyngeal Abscess.** *J. Am. M. Ass.*, 1918, lxxi, 174.

Rush reports the following causes of infection leading to abscesses posterior to the pharynx:

1. Caries of the upper cervical vertebræ, usually of tuberculous origin. Such an abscess, being dorsal



to the prevertebral fascia, is very apt to burrow laterally and appear as a tumor in the neck, dorsal to the sternocleidomastoid muscle, where it should be opened under strictest asepsis to prevent a mixed infection. If unopened, it may follow the brachial plexus into the axilla. Regardless of the prevertebral fascia, it may, however, burrow forward in the midline of the pharynx.

2. Otitis media. The pus probably burrows downward into the upper part of the eustachian tube along the tensor tympani muscle to terminate behind the prevertebral fascia. It tends to point in the same direction as the infection from the cervical vertebral caries.

3. An extension inward of a carotid abscess.

4. Infection of the lymph-nodes of the retropharyngeal space. These nodes are one or two in number on either side of the midline opposite the lateral masses of the atlas. They receive lymphatics from the nasopharynx, eustachian tubes, nasal fossæ, and accessory sinuses. M. N. FEDERSPIEL.

### MOUTH

**Lyons, C. J.: Some Vital Phases of Fractures of the Jaws.** *J. Am. M. Ass.*, 1918, lxxi, 164.

Lyons calls attention to the fact that fractures of the jaws will differ from fractures in other parts of the body in that they are more liable to infection on account of the close proximity of the bacteria-laden fluids of the oral cavity.

He also calls attention, in the consideration of infection in fractures of the jaws, to the presence of alveolar abscesses, which may be existing at the time of the fracture or may be superinduced by the injury. This will greatly delay the process of repair and should be eradicated before repair can take place.

Another condition which will complicate healing of jaw fractures is infection of the antrum.

The treatment of fracture of the jaw consists of the fulfillment of three principal indications: (1) reduction of the broken fragments; (2) retention of the parts in normal relation; (3) prevention or control of inflammatory processes. M. N. FEDERSPIEL.

**Ochsner, A. J.: Clinical Observations Concerning Malignant Tumors of the Jaws.** *Ann. Surg.*, Phila., 1918, lxxviii, 136.

Ochsner reports his observation of 100 cases of malignant tumors of the upper and lower jaws from the standpoint of the clinician. The actual cautery was used in every case in a most vigorous manner. Two cases died from hæmorrhage from the carotid artery where the tumor had extended into the neck. The oldest one of his cases operated upon by means of the cautery has lived twenty-nine years since the operation and is still in excellent health.

Out of 100 cases, 67 per cent were carcinoma; 16

per cent epulis; 16 per cent sarcoma; and 1 per cent chondrosarcoma. The origin of these new-growths was noted and in the cases of carcinoma and epulis the following distribution was found: 47 cases originated from the inferior maxilla; 25 from the superior maxilla; 6 from the antrum of Highmore; 3 from the cheek; 1 from the parotid gland; and 1 from the palatine bone.

In the sarcomatous growths the examination showed that 8 cases originated in the superior maxilla; 4 in the inferior maxilla; 3 in the parotid gland; 1 in the soft palate; and 1 in the cheek.

Ochsner believes that the teeth are usually the cause of malignancy in the jaws. He holds that broken-down crowns and sharp projecting roots, together with faultily constructed bridges and crowns, affording a breeding place for bacteria, are predisposing factors.

The frequency of occurrence of these malignant tumors in the male was found to be much lower than the percentage given by Blair; 72 of the cases occurred in the male, while 28 affected the female. The percentage for the female was considerably lower in the cases of carcinoma than in those of sarcoma and epulis. Of the 67 cases of carcinoma it was found that only 11 were female patients, while in the 33 cases of sarcoma and epulis, 17 were female patients.

As to the duration of the condition before the admission of the patient into the hospital, the following facts were determined: 25 per cent entered before the third month; 25 per cent of cases entered before the sixth month; 23 per cent before the second year; 27 per cent after the second year. In 65 per cent of the cases no statement was made with regard to lymph-gland involvement. Of the remaining 35 cases, 25 showed enlarged glands.

The mortality following these operations was as follows: 3 per cent died during the first day following operation; 4 per cent died before the fifth day; 5 per cent died before the twentieth day; 3 per cent died before the fortieth day; and 5 per cent died after the fortieth day.

The total mortality of the patients while in the hospital amounted to 20 per cent. All of these fatal cases, except two, were carcinomatous, the two exceptions being sarcomatous.

It is interesting to note that in 40 per cent of these fatal cases, a previous incomplete operation or an excision of a piece of tissue for diagnosis had been performed. In the balance of the cases injection of iodine or oil, application of plasters or acid, teeth extraction following the appearance of the lesion, or X-ray application had been carried out.

Of the 100 cases treated in this series, 15 returned with recurrences. Ten returned once, one returned twice, and four returned three times. The permanent results of this series of cases have not been determined. M. N. FEDERSPIEL.

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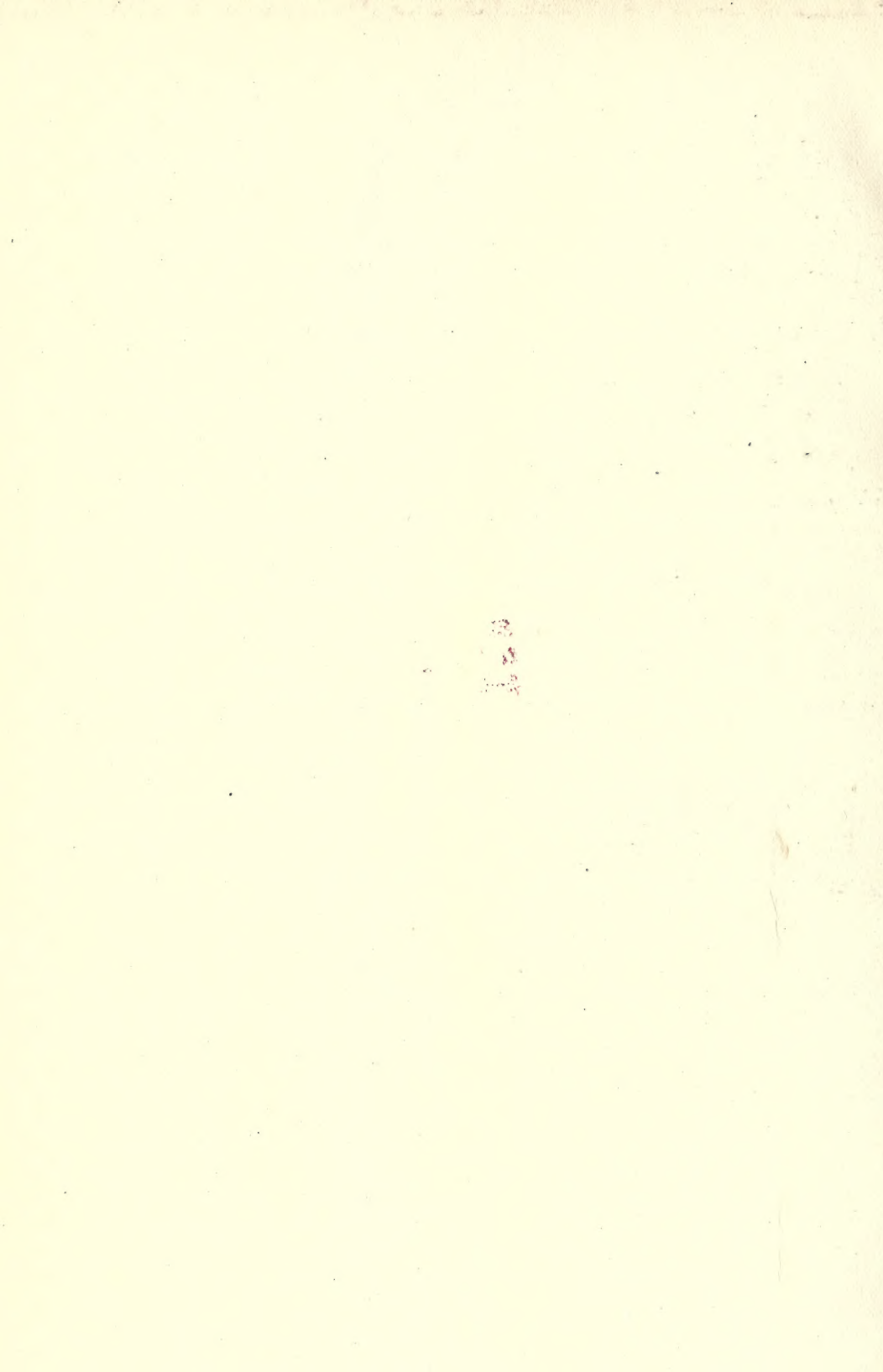












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